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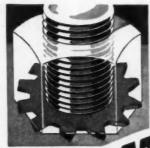
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Automotive Industries

# SHAKEPROOF

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ENSATION HOLDING POWER!



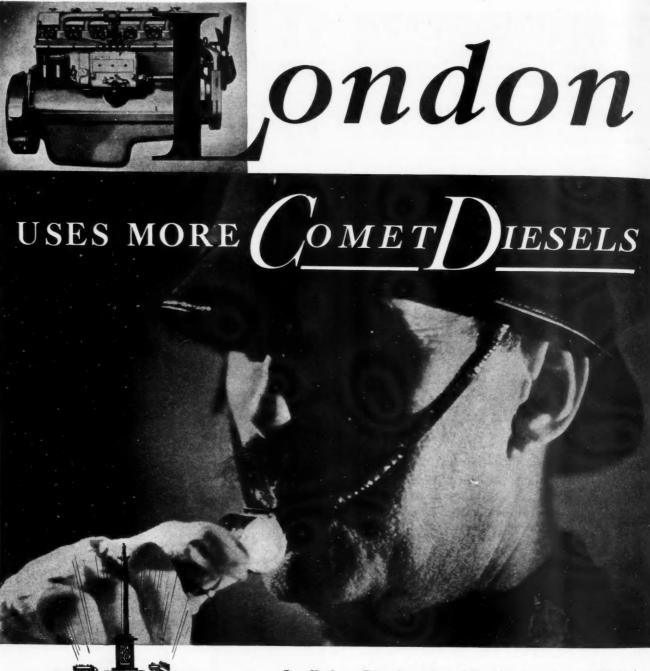


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#### TIME

the Weekly Newsmagazine Says:

that the London Passenger Transport Board of seven, a government bureau, supreme over all London transport lines, has lately been scanning fuel costs of its 6,000 buses and coaches, 850 of which use Diesel engines. The Board announces that all future contracts will be for oil-burning Diesel equipment which it found much less expensive to operate.

In all these Diesel-equipped London coaches and buses, the big majority of the engines are of the *Comet Type*, preferred not only for its marked fuel savings, demonstrated by several years of road tests, but because of its clear exhaust, great smoothness and easy starting.

In America, this Comet Type Diesel is now being built exclusively by the Waukesha Motor Company. Compression ignition engine . . . 100 hp. to 140 hp. . . . just the right size for coaches, trucks and tractors, and it's rumored that the research engineers have another size ready. Write for new Bulletin 1001. Waukesha Motor Company, Waukesha, Wisconsin.

See the Waukesha Engine Exhibit at the Shows-Newark and New York

WAUKESHA ENGINES

October 26, 1935

Automotive Industries

## AUTOMOTIVE INDUSTRIES

Vol. 73, No. 17

THIRTY-SEVENTH YEAR

October 26, 1935

# 4,500,000 Predicted for '36

### Motor Shares Lead Stock Advances

Packard, Chrysler, GM, Reo, Hupp, Studebaker All Actively Traded In

Motor shares were the spear-head in a general stock market advance that got under way with Monday's opening and continued strong up to mid-week. While shares generally made one to four points gain it was the upward movement of automotive issues that sent experienced observers to 1929 archives for comparative statistics. By Wednesday's closing the bulls had pushed the listings to the highest ground experienced in four years.

The steady advance of the automotive industry from the slough of 1932 and 1933 coupled with the well sustained retail demand in the closing season of the current year and constantly accumulating orders at factories for 1936 models all played important parts in the heavy buying of motor stocks. The prediction of a 5,000,000 unit output during the coming year, topping the 1935 estimate of 3,500,000 production, also aided the growing incentive to buy automotive securities.

Few if any of the important issues were neglected. In the early week buying General Motors, Hupp, Reo, Packard, Chrysler, Studebaker, Kelsey-Hayes all achieved trading in lots of 10,000 shares or better. Packard hung up a new high record for any big board stock with a turnover of 165,300 shares. Chrysler made its best move since 1929 when at the opening of the week its position moved up 35% points and General Motors neared its 1930 high mark.

At noon time Thursday these leaders had held their Wednesday closing position despite a slacking off in active trading all through the lists. General Motors had moved down about one-half point while Chrysler gained a fraction of a point. Packard, too, had moved up slightly in Thursday morning trading while Hupp at 3, Reo at 43% and Kelsey-Hayes at 255% held firm.

(Turn to Page 559, Please)

" . . . No Gadgets"



Helen Dryden,

retained by Studebaker to design interior of the new President. Fashion artist Miss Dryden said: "I worked with hardware, carpets, upholstery, instrument boards instead of fabrics, hats, gloves, jewelry, but the principle is the same."

Probably Miss Dryden is the first woman employed by a car company to develop automobile design. Throughout the interior horizontal lines prevail; colors are neutral; there are no gadgets; nothing sticks out; even the ash receivers are flat.

#### Woman Manages Buffalo Show

Marjorie M. Baker, who is said to know her cars thoroughly, will manage this year's Buffalo Automobile Show. It is the first time in 32 years a woman has been in this position. She is executive secretary of Buffalo's Automotive Trade Association, and so far as is known the only woman to hold such a position in a major city.

#### In This Issue

Plymouth Improves Steering and Front Suspension—Page 548.

"Duo Automatic Hydraulic Braking" a Hudson Innovation—Page 550.

Olds Adopts Aluminum Pistons-Page 553.

Four Chrysler Models for 1936 Have Longer, Stronger Bodies—Page 554. Budd Develops New All-Steel Body —Page 557.

Chevrolet Eliminates Errors in Packing for Export—Page 560.

## Confidence Rises As Shows Approach

Industry Optimistic Over Sales Outlook for Next Year; Step-Up Schedules

by Harold E. Gronseth

Detroit News Editor, Automotive Industries

Not in many years has such confidence pervaded the motor industry on the eve of a new sales year as now prevails. Motor executives are unanimous in the view that 1936 will extend further the improvement in automobile business, although opinions vary slightly on the extent of probable gains. Officials have started their index trek to the New York Show in a highly optimistic frame of mind and their optimism this year cannot be discounted by the usual enthusiasm for a new product since they have backed their opinions on the outlook by an investment of many millions for expansion.

Consensus of opinion seems to be that 1936 will show at least a 20 per cent increase in production, which on the basis of an estimated 3,700,000 unit output this year would bring next year's total to approximately 4,500,000 vehicles. One of the major producers is using the figure 4,200,000 cars and trucks for domestic retail sales and exports as a conservative guide in projecting its own schedules.

This estimate allows for 3,000,000 passenger cars and 550,000 trucks in the domestic market and 650,000 vehicles for Canada and export. The projection of a major automobile factory's annual output, points out one executive, involves many factors and is based on careful investigation of many conditions. Cost must be figured far in advance, material commitments arranged to meet anticipated demand and the entire production machinery synchronized to the merchandising task which the sales organization is set to perform. The brisk retail demand that met the new models already introduced is highly encouraging for an active fall season, although conclusive evidence that earlier introductions will materially stimulate sales at this season cannot be had until after the New York Show. Special significance will be attached to the attendance figures this year since they will give some indica-

(Turn to Page 559, Please)



Photo by Margaret Rourke-White

"...a vital factor contributing to the outstanding accomplishments of the United States of America..."

> President Roosevelt

By Presidential proclamation the past week has been celebrated as Air Navigation Week, part of the National Aeronautic Association's "Air Progress" program to stimulate public interest in aviation. Special flights over established federal airways with such planes as the Douglas Transport shown above featured the program.

# Sept. Retail Financing Up 6%; Nine Mos. Gain 16%

The dollar volume of retail financing of new passenger automobiles shows an increase of 6 per cent for the month of September as compared with September, 1934, and an increase of 17 per cent compared with September, 1933, according to preliminary estimates made by the Department of Commerce. As compared with August, 1935, there was a decrease of 17.5 per cent, somewhat more than the usual seasonal decline.

The aggregate volume for the first nine months of this year was 16 per cent above the first nine months of 1934 and 80 per cent higher than for the corresponding period in 1933. Comparisons of September, 1935, with the same month of previous years and the percentage changes from August to September in past years are shown below:

		Sep	tember,	1935.	was:	
6.3 16.9	per	cent	higher	than	September,	193 193
127.6	4.6	6.6	4.6	4.4	44	193
26.1	6.6	44	44	6.6	44	193
6.0	+4	6.6	lower	6.6	64	193
49.1	6.6	6.6	44	6.6	66.	192
	A	ugus	t-Septe	mber	Changes	
		Sept		1935	-17.5	
			6.6	1934	-16.5	
			44	1933	-7.0	
			44	1932	-4.3	
			44	1931	-11.4	
			44	1930	-12.5	
			66	1929	-5.1	

#### Jacoby Captures APBA High Point Championship

Fred Jacoby, North Bergen, N. J., scenic artist, has been announced as the winner of the American Outboard High Point Trophy, the Townsend medal offered by George H. Townsend, former American Power Boat Association president. Jacoby, the first professional to win the scoring championship of the United States, piled up a score of 32,637, almost doubling the total

of any previous winner of the outboard prize. Second place went to Joel Thorne, New Rochelle, N. Y., amateur driver with 26,575 points.

The new champion also won the Stanley W. Ferguson diamond medal representing quality of performance for the total of averages made in each race. He took part in 86 races and two marathons, winning one of them, the Albany to New York race. In other races Jacoby won 50 first places and 11 seconds.

The national Point standing of the first 10 drivers follow:

Driver													Points
Fred Jacoby (P)									 	 			32,637
Joel Thorne (A) .													
L. G. Carlisle (A)													
Sam Crooks (A)													
Gar Wood, Jr. (A	)												11,703
Frank Vincent (P	)												9,292
Thomas Cooper, J	r		(	F	")	1							8,895
Clinton Ferguson	(	A	)										7,950
Bob Meyer (P) .							á	*				. ,	7,930
Don Frazier (A)													7,803

# Tire Price Boost Likely If Suez Canal Is Closed V. P. Reid

V. P. Reid, vice-president and general manager of the General Tire & Rubber Company, Ltd., Toronto, Ont., recently stated that in the event of the Suez Canal being closed because of the Italo-Ethiopian trouble an increase of 60 to 75 per cent on the price of automobile tires may become effective. Spring orders for tires are being made as subject to prices at the time of delivery.

#### Sept. Dollar Volume Index Off 20 Points

The preliminary adjusted index of the value of retail sales of new passenger automobiles shows a marked decrease from August to September, 1935, according to the Bureau of Foreign and Domestic Commerce.

This index was 51.0 in September, on the basis of the 1929-31 average of 100, com-

pared with 71.5 in August and 81.0 in July. Daily average sales, without seasonal adjustment, decreased about 38 per cent from August to September in contrast to a usual decrease of about 13 per cent.

Sales in September, according to these preliminary figures, were 4 per cent less than in September, 1934, and 2½ per cent below September, 1933. The aggregate value for the first nine months of this year was 33 per cent above that for the corresponding period of last year and 79 per cent higher than for the first nine months of 1933.

#### Harding Named to Toledo Industrial Peace Board

L. S. Harding, member of the Textile Labor Board, has been named secretary of the Toledo Industrial Peace Board. Ralph A. Lind, Cleveland, continues as chairman. Five strikes have been averted and two minor strikes quickly settled through peace board machinery.

#### Motor Boat Show Jan. 17

The 1936 National Motor Boat Show will be held in the Grand Central Palace in New York, Jan. 17 to 25, 1936, according to an announcement by Charles A. Criqui, chairman of the exposition committee of the National Association of Engine and Boat Manufacturers.

#### Ford Develops Test Set

A laboratory test set designed to diagnose motor troubles accurately and quickly is being offered dealers and fleet owners by the Ford Motor Co. Developed by Ford, the set sells for \$135.

#### Show Week Calendar

Friday, Nov. 1—Oldsmobile Retail Salesmen's pre-show training meeting and dinner, Essex House; Studebaker dealers' luncheon, Hotel Pennsylvania.

Monday, Nov. 4—International Day Luncheon, 12:30 p.m., Hotel Ambassador; Society of Automotive Engineers annual dinner, Commodore.

Nov. 4 to 6—National Tire Dealers Association annual convention, Hotel New Yorker.

Tuesday, Nov. 5—Nash distributors, dealers and salesmen's luncheon, 12:30 p.m., Hotel Commodore; Graham luncheon meeting, Biltmore, and Auburn dealer luncheon, Commodore.

Wednesday, Nov. 6—Hupmobile dealer luncheon, Commodore, 1 p.m.

Thursday, Nov. 7—Overseas Automotive Club, annual New York Show luncheon, Hotel Lexington; Merchants Association of New York luncheon, 12:30 p.m., Hotel Commodore, and Advertising Club luncheon, 12:30 p.m., Advertising Club.

A complete calendar of all events scheduled for Show Week will be published in the next issue of Automotive Industries.

#### General Motor Demand Steps-Up Steel Volume

Participation on Broad Scale; Few Extraordinary Large Single Commitments

Latest gains in the volume of steel buying by automotive consumers are ascribed to broader participation rather than to extraordinarily heavy commitments from any one consumer.

Orders and specifications are spread over virtually the entire roster of motor car manufacturers and parts makers, with some running rather light and none entailing any out-of-the-ordinary tonnage. Sheet mills in the Detroit and Cleveland area are operating at capacity and some of the strip mills in the latter district have been able to step up production to 80 per cent of capacity. Finishing mills in the Youngstown district are holding recent gains, and while those in the Pittsburgh area are not quite so rushed with orders, they are doing remarkably well in comparison with former months.

Market gossip has it that the volume of sheet business was held back for a time because of the necessity of first overcoming difficulties encountered in the new Ford radiator shell and grille, now being stamped as an integral unit. Announcement of Ford prices was accepted, however, as a signal that these technical troubles were now out of the way.

While some of the present sheet buying is to provide against initial requirements when mass production of new models gets into its stride, steel company sales executives believe that real tonnage demand will not make itself fully felt before the latter part of November. There is also in evidence a certain amount of nervousness that, when such tonnage orders are ready to be placed, there will be more shopping done and more pressure on prices. What they are probably most concerned about is that when attractive tonnage business overhangs the market, competition for as large a slice of it as possible causes keen rivalry among producers, and with market levels no longer under artificial restraint, the price firmness may then be subjected to a more severe test. This week's rate of ingot capacity employed rose to 51.8 per cent, an improvement of 2 per cent over last week's rate and the highest since February 4.

Pig Iron—Automotive foundries continue to figure prominently among buyers. Some are covered for the year's last quarter, but quite a few of these are filling in between arrivals of shipments, while others have duplicated orders placed within the last few weeks. The market is firm, with talk of higher 1936 prices persisting.

Aluminum—Middle West secondary aluminum specialists have lowered their scrap buying prices, thereby indicating that their linkae of scrap is now sufficient to take care of current business. Both the primary and secondary markets are quotably unchanged.

Copper — The market is considerably easier. While producers continue to quote electrolytic at 9½ cents, delivered Connecticut, some resale metal has been offered at 9 cents. The export market has weakened and an end of Italo-Ethiopian hostilities might cause it to slump further.

#### Prophetic?



Charles W. Nash

"There may be fewer companies in the field when 1936 ends, but these companies will prosper by virtue of the actual service they render.."

Nash executives, pre-viewing the coming

year, said:
E. H. McCarty, president—". . . We feel there has been a reaction against the demand for higher speeds in automobiles. . . I am against the stressing of high speeds in automobile advertising."

C. H. Bliss, vice-president and director of sales—"Economy, safety, comfort, appearance and performance . . . are the yard-sticks by which the motoring public will determine its choice of new 1936 cars. . . . With the public in a buying frame of mind, and with automobiles capable of demonstrating their value under actual driving conditions, sales for the industry . . . . should be greatly increased."

#### Ontario to Issue 1936 Licenses in November

Purchasers of new cars in November and December this year will not be required to buy a part-time 1935 Ontario automobile license, it has been announced by T. B. McQuesten, Minister of Highways. Instead these purchasers can buy their 1936 plates after November 1 and these licenses will carry them to the end of December, 1936.

#### Canadian Advertisers Elect Automobile Men

Glen Bannerman, Hudson Motors Ltd., Tilbury, Ont., at the annual meeting of the Association of Canadian Advertisers, Inc., held in Toronto, was elected as one of the vice-presidents of the association. Among the directors selected for the ensuing year were: A. M. Miller, Chrysler; C. B. Watt, General Motors of Canada; E. F. Millard, Ford of Canada.

#### Frank A. Hatch

Frank A. Hatch, president of Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y., died at his home in Montour Falls last week

### GMAC Announces 6% Finance Plan

Dietz Says Commercial Investment Trust Co. Preparing New Schedules

General Motors Acceptance Corp. this week announced its new "GMAC Six Per Cent Plan" for financing car purchases. Principal objectives of the scheme are lower financing costs, simplify financing for the purchaser and "bring all units of the 1936 General Motors line within reach of new thousands of potential car owners." According to the GMAC this plan represents the lowest cost national plan for the purchase of new cars.

An example of the plan's functioning is illustrated in the case of a Buick 36-40 four door sedan delivered in Philadelphia. The delivered price, \$1065, in that city for such a model includes freight and handling charges of \$75.13; steering wheel, \$12.50; standard accessories, \$25.50, "EO8" charge, \$23.70; other accessories, \$16.20. If the purchaser makes a cash payment of \$465 the balance is \$600; to this is added insurance costs of \$42. The buyer then has an unpaid balance of \$642 to liquidate over a 12 months' period. Under the new GMAC plan six per cent is added to this total increasing the unpaid balance to \$680.52 payable within the year.

Should the car buyer desire to extend his financing beyond the 12 month period then a charge of one-half of one per cent is added for each additional month. At the same time it must be remembered total costs will increase to a certain extent, for if the financing should be written on a 14 months' plan the insurance charge would be on an 18 months' basis and thus raise the cost somewhat above the proportional 14 months' cost.

Arthur O. Dietz, president, Commercial Investment Trust Co. announced his company is now considering new rate schedules which will be announced shortly. He made the announcement when questioned regarding what action his company would take in response to the GMAC plan.

#### Pontiac 1936 Prices

Master Six	Price	Old	Change
Sedan, 2-door Tour. sedan, 2-door Sedan, 4-door Touring sedan, 4-door Coupe Sport coupe Cabriolet	. 700 . 720 . 745 . 615 . 675	\$665 695 715 745 615	+10 + 5 + 5 same same
DeLuxe Six			
Sedan, 2-door	. 745 . 770 . 795 . 665	715 745 765 795 675 725	+ 5 same + 5 same 10 5
DeLuxe Eight			
Sedan, 2-door Tour. sedan, 2-door. Sedan, 4-door. Tour. sedan, 4-door Coupe Sport coupe	795 815 840 730	775 805 830 860 730 780	- 5 10 15 20 same + 5

## Berry Repeats Bid to NRA Conference; Reeves Warns Against Harmful Effect

Despite a warning from Alfred Reeves, AMA vice-president and general manager, that injections of "controversial and unsettling discussions" will do recovery more harm than good, Major Charles L. Berry, NRA coordinator, has reissued his invitations to the automobile and steel industries to participate in his proposed round table conferences in Washington.

Early this week Mr. Reeves wrote Major Berry that "recovery is proceeding and to inject controversial and unsettling discussions into the picture would surely do more harm than good. I am sincerely hopeful therefore that no attempt will be made to hold meetings on the subject during the

period of study."

Major Berry in his response told Mr. Reeves that the conferences do not contemplate the consideration of further NRA legislation, but that the purpose is to consider what would be the course most adaptable to industry as a whole. It was pointed out, however, that if management and labor are able to compose their differences with reference to legislation some instrumentality might be presented to Congress.

The meetings in Washington, Major Berry told Mr. Reeves, do not contemplate arriving at any solution through mass meetings but that it is intended that each industry and its immediately allied industries will meet for the purpose of giving consideration to what would be the best solution for their

industry and to recommend their point of view to a subcommittee to be made up of representative men from all industries.

"It is quite possible, of course, that the answer might be that no legislation at all is desired," said Major Berry. "On the other hand, they might conclude that some legislation is necessary and the only way that this answer can be arrived at is by and through the process of industrial conferences. This is the basis upon which the proposed conference is to be held here."

Major Berry agreed with Mr. Reeves that full and exhaustive studies should be made of the situation and pointed out that this course is being pursued. He assured Mr. Reeves that there is no intention of injecting controversial matters but instead it is proposed to compose any differences as may exist.

"For the reasons as stated in the foregoing, may I most respectfully request that your association reconsider the decision arrived at and set forth in your communication of the 11th because I frankly am anxious to see every industry represented so that if an understanding is arrived at, it will be general in its application," said Major Berry.

Alfred P. Sloan, Jr., GM president, also replied to Major Berry's invitation to the conference, and it is understood made it clear that General Motors was opposed to any resurrection of NRA.

25 per cent of its volume and less than 50 per cent of its receivables outstanding are represented by instalment paper covering the sale of new automobiles.

"During the depression, Commercial Credit has progressively reduced the financing rate it receives on instalment paper, but the amount of such reduction has been more than offset by its increased volume and by reduced losses, expenses and low rates on borrowed money."

#### Pontiac Adopts Official Names

From now on, the three lines of Pontiac cars will be officially named as follows:

The Pontiac Master Six (formerly the Pontiac Six or Standard Six). The Pontiac Deluxe Six.

The Pontiac Deluxe Eight.

#### Motor Trucks Exempt From US Embargo List

Studebaker Shipped 500 Vehicles Into Egypt War Area Since Last June

Studebaker has shipped more than 500 stock trucks into Egypt, Eritrea and Italian Samoliland since early last June, representing more than \$500,000 worth of business. Three weeks ago Harold S. Vance, chairman of the board and Arvid L. Frank, head of the export corporation, conferred with government officials in Washington concerning these truck shipments into Africa. They were informed the United States Government embargo on war supplies does not extend to motor truck chassis and probably will not be extended to include them.

"In view of current developments in the war area, however," Mr. Frank said, "peace between Italy and Ethopia may bring an end to this business."

Ostensibly the orders received from importing companies in Egypt have no actual connecting with Italy's war needs. No shipments are understood to have been made directly to Italy or to Italian supply bases in Africa. It is assumed by company officials that the unusually large orders at this time are intended to supply the Italian troops. Only stock chassis have been shipped from South Bend thus far, Mr. Frank said. These are equipped with bodies in Alexandria, Egypt.

# CCC Rates 6% in Several Sections Now, Duncan Says

Financing rates of Commercial Credit Co. in several territories during the past year were less than six per cent plus the regular conference rates for fire, theft and collision insurance prevailing in such territories, A. E. Duncan, chairman of the company, told a representative of Automotive Industries this week when asked how GMAC's new six per cent plan would affect the Commercial Credit Co.

"Inquiries are being received as to what may be probable effect on the earnings of Commercial Credit Co. of the recent 6 per cent plan announced by General Motors Acceptance Corporation for financing the retail time sales of General Motors new cars," Mr. Duncan said. "The past year in several territories the financing rates of Commercial Credit Co. were less than 6 per cent plus regular conference rates for fire, theft and collision insurance prevailing in such territories, the cost of which was included in the retail financing rate. Commercial Credit Co. has never actively competed for and now has very little instalment paper arising from the sale of new cars of General Motors. Commercial Credit does not anticipate any great difficulty in making necessary readjustments in its financing rates on the retail sale of new automobiles which have been under consideration for some time, so that they will be reasonably competitive and without seriously affecting its earnings. Less than

#### Nine Months' Earnings Statements

Vehicle Manufacturers Packard	\$776,873	d \$5,348,409
Caterpillar Tractor Co 2 companies reported—Total	4,311,643 \$5,088,516	2,932,892 \$2,415,517
Other Automotive Companies  Bohn Aluminum and Brass Corp.  Motor Products Corp.  Clark Equipment Co.  Edward G. Budd Mfg. Co.  Budd Wheel Co.  Campbell, Wyant and Cannon Fdy. Co.  Houdaille Hershey Corp.  Mullins Manufacturing Co.  Noblitt-Sparks Industries, Inc.  Federal Mogul	1,101,563 718,694 d 24,902 310,327 559,592 392,792 1,942,765 361,933 357,853 127,617	1,263,456 252,103 200,597 d 87,282 116,215 853,824 171,792 236,973 107,924
10 companies reported—Total	\$5,848,240	\$3,138,131
12 Automotive companies—Grand Total	\$10,972,756	\$5,553,648
Aircraft Companies Lockheed Aircraft Corp. (6 mos.)	125,480	d 48,761
Miscellaneous  Barnsdall Corp. Automobile Finance Co. duPont deNemours & Co. Plymouth Oil Co. d—Deficit.	541,691 70,364 40,154,667 537,242	64,049 38,727,818 543,235

# The World On Wheels

In motor trucks Haile Selassie's troops leave Addis Ababa for the front



A "carretta" in which Italy's fighting men move when engaging the enemy



Italy's leader drives his car at high rates of speed on race track



Haile Selassie's private plane of German make



Automotive Industries

Il Duce's children play in their miniature car

Tractors transport Italian army mules



## March of Time, "Senator" Ford Feature Program of SAE Annual Dinner, Nov. 4



Adolph Gelpke (right), SAE annual dinner chairman, dis-cusses details of "March of Time" broadcast with Ar-thur Pryor, Jr., pro-gram director and son of bandmaster.

. . time marches on!"

For the first time since its inception the March of Time radio program will be presented outside Columbia Broadcasting Co.'s studios when this famous feature goes on the air from the ballroom of the Commodore Hotel, New York City, as part of the entertainment program of the annual dinner of the Society of Automotive Engineers.

The dinner, the only official automotive banquet during Show Week, Nov. 2 to 9, is scheduled for Monday, Nov. 4. A recep-

tion at six o'clock will precede the dinner, scheduled for 6.30 P. M. William B. Stout, SAE president, will preside as toastmaster. Another feature of the program will be "Senator" Ford, who has wise-cracked for automotive men many times. He will title his talk "Stumbling Through the 1936 Automobile Show." The committee in charge of the dinner, headed by Adolf Gelpke, Autocar assistant chief engineer, has announced that reservations already exceed 500.

Details of Chevrolet **Expansion Program** 

Detroit and Michigan shared largely in the Chevrolet expenditure of millions of dollars for increased capacity of manufacturing plants. Among the principal developments were the following:

Detroit Gear and Axle plant—Building addition, 160 by 200, and equipment, for the production of sheet metal stampings.

Detroit Forge plant-Extension of boiler and turbine rooms of the power house, 10,000 sq. ft., and equipment with a new 7500 kilowatt turbo-generator, high pressure steam generating units, condensers, etc.; building extension, 60 by 125, to house new axle shaft rolls; new building, 30 by 50 feet, for roll die room; new building, 25 by 40, for die

room heat treating.

Bay City (Mich.) Small Parts plant—Two Bay City (Mich.) Small Farts plant—I wo additions, total 57,000 sq. ft., to increase production capacity, and to take over the manufacture of parts formerly produced at Flint. Saginaw (Mich.) Grey Iron foundry—Two additions, 29 by 400 and 42 by 180, to enlarge

core room; addition, 8000 sq. ft., to mainten-

core room; addition, 8000 sq. ft., to mainten-ance and pattern shop building.

Saginaw Service Parts Manufacturing plant—Entire plant 50,000 sq. ft., formerly used by the Saginaw Motor plant recondi-tioned and equipped with machinery for the manufacture of service parts, to relieve the Flint Motor plant and the Detroit Gear and Ayle plant. Axle plant.

Saginaw Parts Manufacturing plant— Former General Motors Crankshaft plant, 160 by 690, taken over and equipped for the manufacture of production parts; new build-

ing, 700 by 84, erected to house forge and bumper plant.

Muncie (Ind.) Transmission plant-Plant of Muncie Products, 250,000 sq. ft., taken over and equipped with machinery for the manufacture of transmissions.

Flint (Mich.) plant-New hospital building, 48 by 80 feet.

Besides the construction and equipment of the new buildings listed, Chevrolet carried out a systematic program of modernization in plants in these and other cities, replacing old machinery with new, and installing up-todate conveyor systems, new material handling methods, and other improvements to give better results and to increase capacity.

Among the assembly plants, the greatest development of the year was the completion of the new plant at Baltimore, Md., opened with public ceremonies last April. In addition to the general improvements carried out at all assembly plants, to improve work-ing conditions and increase production, Chevrolet enlarged assembly plants in six of their ten cities. New buildings are:

Flint, Mich.-New Fisher body storage buildings, 95,000 sq. ft.

St. Louis, Mo.—Addition to parts building, 40,000 sq. ft.; two-story building addition, 79 by 80, for offices and body storage; new loading dock, 40 by 100.

Atlanta, Ga.-Addition to parts building, 60,000 sq. ft.

Kansas City, Mo.—New parts building, 60,000 sq. ft.; addition to Chevrolet wing, 33,000 sq. ft.; addition to Fisher Body wing, 86,000 sq. ft.; addition for storage, 40,000 sq. ft.

Tarrytown, N. Y.—Storage balcony, 28,000 sq. ft.; Fisher Body storage building, 120,900 sq. ft.

Buffalo, N. Y .- Extension of second floor for storage, 6,000 sq. ft.

All the foregoing operations are virtually complete, and most of them are already in operation; those not yet in use will be ready for production before the end of the year.

At Indianapolis, one of the largest projects of the program has just got under way with the beginning of work on an immense new plant for the manufacture of commercial bodies. The new buildings will total 470,400 sq. ft. of floor space. Half of the present commercial body plant will be demolished immediately, to give way to new buildings, 600 by 400, including a power house. Body building will continue in the remaining half of the present plant until the first trace of the present plant until the first stage of the new operation has been completed. The remainder of the old plant will then be razed, and a new building, 720 by 320, will be erected.

### Cars in \$501-\$750 Wholesale Class Gain 44.6% in 9 Mos. Production

#### Passenger Car Production by Wholesale Price Classes

(U. S. and Canada) Nine Months 1935 and 1934 Compared.

	187 ann	4004	Per Cent	Per Cent	of Total
	1935	1934	Change	1935	1934
\$500 and under	1.523.381	1.319.139	+15.8	61.00	65.28
\$501-\$750	876,175	605,979	+44.6	35.08	29.99
8751-\$1,000	69.561	57.251	+23.5	2.78	2.83
\$1,001-\$1,500	16,455	24.140	-31.6	.66	1.19
\$1,501-\$2,000	6.218	6.959	-10.7	.25	.34
\$2,001-\$3,000	3.643	5,605	-35.0	.15	.28
\$3,001 and over	1,958	1,789	+ 9.3	.08	.09
Tetal	9 407 901	0 000 000	1 00 5	100.00	100.00

#### Truck Production by Capacities

(U. S. and Canada) Nine Months 1935 and 1934 Compared.

	1935	1934	Per Cent Change	Per Cent	of Total
1½ tons and less 2 to 3 tons 3½ tons and over Special and buses	534,031 27,109 4,565 3,365	436,742 29,096 4,305 1,690	$   \begin{array}{r}     +22.4 \\     \hline     -6.5 \\     +6.0 \\     +98.9   \end{array} $	93.85 4.76 .80 .59	92.56 6.17 .91 .36
Total	569,070	471,833	+20.5	100.00	100.00

#### Hails 100 Octane

"Better for China Clippers. . ."



Dr. Graham Edgar

The first commercial order for gasoline, octane number 100, has been placed by the U. S. Army, which will use 300,000 gal. of the fuel in experiments on the increase of engine power without increase in weight, according to Dr. Graham Edgar, Ethyl Gasoline Corporation's vice-president in charge of research.

Gasoline of this character, Dr. Edgar says, permits further increases in the supercharging of aircraft engines . . . would permit higher payloads in air transport . . . more than compensating for the increased cost of the fuel.

Four major gasoline-producing companies have pooled high-Octane processing patents in a new company. For commercial use the fuel is produced by blending "polymerized" gasoline with present types. Further research is necessary, Dr. Edgar concludes, before the ultra-Octane fuels will be available in large quantities for ordinary airlines, but the way is open.

#### Literature Available

(Obtainable on Application to the Companies Named)

Reeves Pulley Co., Columbus, Ohio, has issued a "Speed Control Handbook" which covers completely the Reeves variable speed transmission and its application in modern manufacturing.

The Mine Safety Appliances Co., Pittsburgh, Pa. has published a bulletin covering the M.S.A. carbon monoxide indicator, a portable instrument designed to indicate dangerous concentrations of carbon monoxide in the air.

A folder entitled "Union Cold Drawn Steel and the Machine Tool" has just been received from the Union Drawn Steel Co., Massillon, Ohio.

Performance records of 55 applications of Carboloy tools at the Machine Tool Builders' show are described and illustrated in a booklet just published by the Carboloy Company, Inc., of Detroit, Mich.

The Federal Bearings Co., Inc., Poughkeepsie, N. Y., has just brought out the fifth edition of its Ball Bearing Service Manual for passenger cars, trucks, buses and tractors. A complete interchangeable ball bearing table is included, giving all types of Federal ball bearings and the corresponding numbers of six other companies.

## Ford Soy Bean Requirement 1,000,000 Bushels Yearly for Million Car Output

The soy bean production of 50,000 acres will be required by Ford Motor Co. in 1936 for parts and materials derived from this product of the soil. Ford has about 12,000 acres in soy beans and expected to depend on outside sources for the balance of requirements.

The company's \$4,000,000 mill, now nearing completion at the Rouge plant, is designed to supply parts on a 1,000,000 car program annually. The mill, 400 ft. in length, when fully equipped, will contain about 400 moulding machines to turn out soy bean plastic gear shift lever balls, horn buttons, window trimmings, coil-case covers, distributor heads and bases, and other parts as experiment proves the utility of the material.

On the basis of 1,000,000 cars annually, Ford will require 1,565,000 gallons of oil which means an annual production of approximately 1,000,000 bushels of beans and substantially more of the bean meal than is needed for Ford plastic products, providing an excess which can be used by others for purposes such as stock feeding and food products. Of the 1,565,000 gallons of oil required, 825,000 gallons would be used for paint, 540,000 gallons for ingredient in shock absorbers and 200,000 gallons for core oil in the foundries.

The use of plastic products in small parts and window trimmings will reduce the weight of the average Ford car by about 20 pounds. While the cost per pound of this material is more than that of steel, the polishing and finishing of the latter brings its cost somewhat in excess of the finished

plastic product. Henry Ford's experiments in the use of the soy bean in automobile manufacture cost him more than \$1,000,000 up to Sept. 1, 1934.

#### GM to Stage Special Show In Waldorf November 2-9

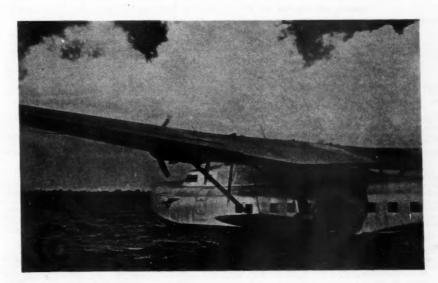
A special showing of General Motors cars, occupying the entire third floor of the Waldorf-Astoria, has been planned for the period of the New York automobile show, supplementing the regular General Motors exhibits of cars at the Grand Central Palace, November 2-9, inclusive. This special showing will enable General Motors to display a large selection of motor cars—44 in all—in a convenient grouping.

In addition to the display of cars, exhibitions of automotive safety engineering, automotive research and design and some phases of precision manufacturing will give the showing a decidedly educational value. Murals, decorative standards and flowers have been chosen for the decorative background.

The showing will open at 2 p.m., Saturday, November 2, and will be open thereafter from 10 a.m. to midnight.

#### Charles M. Power

Charles M. Power died at his home in Cleveland last week. Mr. Power was general sales manager of the Cleveland Chain and Manufacturing Co.



The China Clipper—giant Martin plane accepted by Pan-American Airways, Inc., for trans-Pacific work. Weather permitting the ship was scheduled to leave Baltimore this week for Miami, Fla., for severe flight tests before proceeding to the west coast to be commissioned into the company's regular service

#### Present Hupp Directors Upheld in Andrews Suit

The present board of directors of Hupp Motor Car Corp. was upheld and personal contracts held by Archie M. Andrews involving the corporation were declared void in an oral decision given by Judge Arthur J. Tuttle in Federal District Court at conclusion of the suit brought by J. Walter Drake. An appeal of Judge Tuttle's decision will be taken to the Circuit Court of Appeals at Cincinnati, A. M. Lowenthal, counsel for Mr. Andrews announced. Judge Tuttle gave both sides 10 days to file a statement of facts in the case, and gave the plaintiff five days to file a brief. A formal decree will be entered later, if necessary, the court said.

The court ruled that the minute books recording the affairs of the directorate are the property of the corporation under the present management.

#### Chevrolet Holds Pre-View for Staff at Proving Ground

A week of daily pre-views and demonstrations of Chevrolet's 1936 models, at the General Motors Proving Ground, Milford, Mich., made up the Chevrolet Motor Company's program for introducing its new models to its national field organization, its Detroit zone dealers, and representatives of trade papers and newspapers of the Detroit area. Each day's program was followed with a dinner at the Book-Cadillac Hotel, Detroit, and with a second-day series of meetings in the General Motors building

#### New Illuminating System Devised for Detroit Show

Detroit's Automobile Show, scheduled to open Nov. 9 this year, will not be hampered by poor visibility. Lighting arrangements, according to H. H. Shuart, show director, will consist of two separate types of illumination, one for the aisles and an entirely different set-up for car and accessory displays. This new manner of lighting is expected to increase illuminating efficiency approximately 150 per cent.

#### NLRB to Hold Fruehauf Labor Act Hearing Nov. 6

Hearing on charges that the Fruehauf E. Homer Fahrney Trailer Co. violated the National Labor Relations Act will be held at 10 A. M., Nov. 6, before William R. Walsh, local representative for the National Labor Relations Board

The complaint against the Fruehauf Co. was brought by the Detroit unit of the United Automobile Workers Federal Union, charging discrimination and coercion in alleged discharge of six employees because of their agitation for collective bargaining with the company.

Acheson Colloids Corp. will be represented with a display booth at the Detroit Automobile Show, Nov. 9-16.

#### A. O. Smith Common Stock Now Listed on Big Board

Listing of A. O. Smith Corp. common stock was transferred this week from the New York Curb Exchange to the Stock Exchange when the governing committee passed favorably on the application to list the corporation's 500,000 shares of common The corporation's balance sheet as of July 31 shows total assets of \$24,065,768. Current assets totaled \$6,001,257 against current liabilities of \$2,359,246. Cash as of that date amounted to \$640,628. Balance of surplus totaled \$17,194,906, a decrease of \$663,105 from the 1934 figure.

Production of automobile frames for the past five fiscal years has been as follows:

ear en	e	d	1												Number o	f
1931															. 1,365,42	8
1932															. 915.01	4
1933															. 766,64	3
1934															. 1,187,49	4
1935																õ

E. Homer Fahrney, founder and president of the Universal Motor Co., marine engines. and the Universal Foundry Co., both at Oshkosh, Wis., died recently of a heart attack. He was 59 years of age. Mr. Fahrney was a member of the SAE. His residence was in Oak Park, Ill.

#### Murray Gibson Sawyer

Murray Gibson Sawyer, Chrysler export representative, died at Stanleyville, Belgian Congo, in West Africa, on Oct. 6. born at Dixon, Ill. Surviving are his widow, Sarah Fulton Sawyer, of New York.

### Motor Exports for 9 Months of 1935 Climb \$17,400,000 Above Same Period Last Year

Exports and Imports for the Automotive Industry for September and Nine Months ended September 1935-1934

	19	Septer		934		Months En		mber 934
	Number	Value	Number	Value	Number	Value	Number	Value
Automobiles, parts and accessories.  Motor trucks, buses and chassis (total).  Under one ton One and up to 1½ tons.  Over 1½ tons to 2½ tons Over 2½ tons	7,081 677	\$13,321,813 3,787,844 256,051 2,360,739 873,645 265,088	7,530 808 5,815 698 164	\$13,995,207 3,781,544 287,874 2,572,132 597,276 290,159	73,657 6,549 53,980 10,944 1,754	\$171,871,830 38,321,598 2,274,893 24,764,703 8,093,333 2,825,669	70,998 7,334 54,909 7,075 1,380	\$154,430,871 33,582,157 2,375,155 23,000,568 5,675,137 2,330,485
PASSENGER CARS								
Passenger cars and chassis.  Low price range \$850 inclusive.  Medium price range over \$850 to \$1,200 \$1,200 to \$2,000  Over \$2,000	5,622 5,077 328 78 42	3,247,376 2,665,711 316,787 123,642 101,308	10,236 9,459 490 151 59	5,571,988 4,716,614 465,893 213,428 143,362	125,982 116,681 6,842 988 631	70,823,431 60,806,910 6,489,024 1,516,411 1,666,192	119,628 109,799 6,632 1,724 555	65,915,103 55,074,556 6,388,403 2,645,163 1,462,449
PARTS, ETC.								
Parts except engines and tires	49	3,580,385 1,967,101 297,802 320,047 649,828 322,721	112	2,152,957 1,803,958 215,805 207,474 1,460,751 596,256	266	35,474,715 19,143,890 2,237,514 3,040,441 5,562,576 3,773,106		31,017,772 16,365,843 1,971,319 1,885,364 6,660,336 3,090,683
INTERNAL COMBUSTION ENGINES								
Stationary & Portable: Diesel and semi-Diesel. Dther stationary and portable. Not over 10 hp. Over 10 hp.	726	53,201 44,195 82,522		24,868 22,270 57,652	7,288 1,174	593,689 412,661 653,363	4,327	229,328 278,502 487,107
Automobile engines for:								
Motor trucks and buses	201	68,233 12,997 125,692 118,650	554 231	16,030 38,702 449,154 104,336	3,444 19,192 412	476,101 1,232,876 1,689,236 1,202,749	798	1,250,591 3,114,596
IMPORTS								
Automobile and chassis (dutiable)								

# Frost Presents NADA Program to Directors

Lane, Ernst Resign; Will Close Washington Office; Guy New Legal Officer

The program developed by the executive committee named by the directors of the NADA to direct the affairs of the association, was presented last week in St. Louis to a group of representatives of important state associations by Jack Frost, general manager.

It is understood that the new program contemplates operation on an annual budget of \$120,000 to come from dues of \$12, with provisions for a \$4 commission to state associations where they do the selling.

J. Reed Lane, general counsel, and Walter Ernst, who headed the Washington office of the association, have resigned, effective Oct. 31, and the office is being closed. Walter Guy has been named Washington legal representative. According to reports that could not be confirmed, George Derrand William Burruss will serve the association in the field.

Present at the meeting were Stapley, New York; Ferrell, Iowa; Klugh, Pennsylvania; Bailey, Omaha; Shuart, Michigan; Daily, Ohio; Raine, Maryland, and Benson, Minnesota. It is understood that the new program met a mixed reception, some of the state representatives feeling that they could cooperate successfully with others taking a contrary view.

# McKinstry Heads Harvester Co. Executive Committee

A. E. McKinstry has been named chairman of the executive committee of the International Harvester Co. board of directors. Formerly this committee was known as the financial committee. Election of Harold F. McCormick to the chairmanship of the company left the executive committee chairmanship vacant. Mr. McKinstry resigned as president of the organization last May but retained his place on the board and committees of which he was a member.

#### Toledo Employment Gains

Toledo's employment continued to climb during the last week. Fifty-one plants, most of them interested in automotive parts and supplies, reported 20,370 names on payrolls, a gain of 680 over the previous week and compared with 13,097 in the same plants a year ago.

#### Plymouth 1936 Prices

Model	1936	1935	Change
Business coupe	\$510	\$510	None
Bus. 2-Door Sedan	545	535	+10
Bus. 4-Door Sedan	590	570	+20
Deluxe Coupe	580	575	+5
Deluxe 2-Door Sedan.	625	625	None
Deluxe coupe with			
rumble	620	630	-10
Deluxe 4-Door Sedan	660	660	None
Deluxe 2-Door Tour.			
Sedan	645	650	-5
Deluxe 4-Door Tour			
Sedan	680	685	5

#### Warns IAEngineers



A. J. Hancock

Solemn warning against the encroachment of the commercial point of view on the automotive engineering profession was sounded by A. J. Hancock in his recent presidential address to the Institution of Automobile Engineers (England). Presented by custom in sequence to all "centres" where the IAE is organized, the address cautioned against the commercial outlook as being "short" in its viewpoint, because of its immediate concern with the profit motive... too prone to fasten the name "invention" on mere commercial expedients in automotive design. It requires "the mind of a truly great man," he said, to reconcile properly the two points of view present in every enginering-manufacturing-sales operation.

#### Distributors "Out" on Lincoln-Zephyr Sales

Rumors current during the past few weeks that the Lincoln-Zephyr would be marketed through distributors are unfounded. W. C. Cowling, when asked about this possibility by an Automotive Industries representative, said: "that's out." It is understood the Ford organization has several plans in mind and the probability at the moment appears to be that this new car will reach the consumer via the regular Lincoln dealers with Ford car dealers being added later.

#### **By-Lines**

By WILLIAM S. KNUDSEN, executive vicepresident, General Motors Corp., in the Oct. 24 issue of *Iron Age*: "Safety Goes Back to the Foreman."

By JOHN C. LONG, director of publications, Bethlehem Steel Corp. and former educational director of the Automobile Manufacturers Assn., in the September issue of Scribner's Magazine: "Dwight W. Morrow, The End of an Era."

By ALEXANDER KLEMIN, director of the Daniel Guggenheim School of Aeronautics, New York University, in the September issue of Scribner's Magazine: "An Airplane in Every Garage?"

#### Chevrolet Dealers Sure of '36 Stocks

Production Facilities Extended to Supply New Models by Nov. 2

The Chevrolet Motor Co. preparing the introduction of its 1936 models on Nov. 2 has reopened all its manufacturing plants and its 10 assembly plants and will have built more than 65,000 units by the end of October. Schedules for November and December call for a greatly increased production. The introductory day, officials say, will find every one of the company's 10,000 dealers stocked with display cars and in a position to take orders for immediate deliveries.

Employment is increasing rapidly in Chevrolet plants as the supply of units and bodies for the new models increases daily. The change-over from 1935 models to 1936 models was completed early in October after a brief shut down during which plants were realigned for increased production.

"There will be no shortage of models this year," said W. E. Holler, vice-president and general sales manager. "We not only have been in full sway long in advance of the automobile shows, but we have in addition the advantage of a 25 per cent increase in our production capacity both in assembly plants and in our factories, making engines, transmissions, axles and other units.

"Knee action is here to stay—we have not considered for a moment omitting it from Chevrolet Master Deluxe models for 1936. Our 1936 models will offer the same option in springing as the 1935 models, that is the Master Deluxe cars will be available with either knee action or conventional springs and the standard models with conventional springs

Chevrolet has made great changes in its plant set-up for manufacturing leaf springs and also has purchased much new machinery for the making of leaf springs. The reason is that we needed these facilities because we will introduce a greatly improved design of leaf spring suspension in the 1936 standard models. The effect is to improve the ride by changing the layout and the design of the leaf springs so that they give more nearly equal front and rear action. More than 1,000,000 new knee action Chevrolets are in use and during the current year more than 96 per cent of purchasers of the Master Deluxe models chose knee action ears."

The Lebanon Steel Foundry has appointed Peter A. Frasse & Co., Inc., as sales representatives for its corrosion, stainless, and heat-resistant alloy cast products.

## Business in Brief

## Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

There were several indications of a continuation of improvement in general business last week. Steel operations resumed their rise. There was a further gain in retail sales, and wholesale lines were active. Despite the warm weather, the demand for autumn wearing apparel was comparatively good.

#### Car Loadings Continue Gain

Railway freight loadings during the week ended Oct. 12 amounted to 734,275 cars, which marks an increase of 27,397 cars above those in the preceding week, a gain of 97,275 cars above those a year ago, and a rise of 63,594 cars above those two years ago.

#### Food Prices Move Upward

Retail food prices rose 0.1 per cent during the two weeks ended Sept. 24, according to the Bureau of Labor Statistics. The current average is 24 per cent above that for 1913 and 6.6 per cent above that for a year ago. Of the 48 items included in the index, 13 increased; 20 declined; and 15 remained unchanged.

#### Current Output Sets Record

Production of electricity by the electric light and power industry in the United States during the week ended Oct. 12 was 12.3 per cent above that in the corresponding period last year. The current figure marks a new all-time high; the previous high was established during the week ended Oct. 5.

#### **Building Contracts Up**

The improvement in residential building continues to be the most important development in the construction field. Residential building contracts awarded during September in 37 eastern States amounted to \$41,810,800, as compared with \$40,528,300 for the preceding month and only \$17,853,600 for the corresponding month last year. However, despite the upturn in residential work thus far in 1935, total construction activity has failed to reach the volume reported for the corresponding period last year.

#### Crude Production Gains

Average daily crude oil production in the United States for the week ended Oct. 12 amounted to 2,781,750 barrels, as compared with 2,719,600 barrels for the preceding week and 2,421,650 barrels for the corresponding period last year.

#### Fisher's Index

Irving Fisher's index of wholesale commodity prices for the week ended Oct. 19 stood at 85.5, as against 85.8 the week before and 85.6 two weeks before. The current figure marks the first weekly decline since the end of August.

#### Federal Reserve Statement

The consolidated statement of the Federal Reserve banks for the week ended Oct. 16 showed a decline of \$1,000,000 in holdings of discounted bills. Holdings of bills bought in the open market and of government securities remain unchanged. Money in circulation declined \$2,000,000, and monetary gold stocks increased \$121,000,000.

at 600 lb. To meet these requirements the Mack company offered its Type 21 pressure. volume centrifugal pumper. Delivery of the pumpers will start in 90 days, and when completed the City of New York will have received a total of 187 pieces of fire apparatus from Mack since 1912.

The pumps are of the four-stage pressurevolume type, pioneered by the Mack company in 1927. When arranged in parallel the full volume is delivered at normal pressure, while with the series arrangement a reduced volume is delivered under increased pressure.

#### Unusual Lighting Effects To Feature Chicago Show

The Thirty-sixth Annual Chicago Automobile Show, to be held during the week of November 16 to 23, will be the only national show this year in which every American make of car will be exhibited. The show will be held in the International Amphitheater.

Unusual lighting effects have been designed. A huge star will throw its light on each make displayed, the entire effect giving the name "Hall of Stars" to the show. An arena, surrounded by 12,000 seats, will occupy the center of the hall, and de luxe models of each make will surround this, each being illuminated by a star. In the center of the arena, the various makes of cars will be exhibited in turn on a rising stage, a two-minute description being given of each.

# August Tire Shipments 10% Above Last Year

Shipments of pneumatic casings during the month of August, 1935, are estimated at 4,739,259 units, a decrease of 13 per cent below July, although 10 per cent above shipments of August last year, according to the Rubber Manufacturers' Association, Inc.

This organization estimates production of pneumatic casings for August to be 3,992,800 casings, an increase of 13 per cent above July and 13 per cent over August, 1934. Pneumatic casings in the hands of manufacturers Aug. 31 are estimated to be 7,805,054, a decrease of 11.8 per cent below stocks on hand July 31, and 10.3 per cent below stocks on hand Aug. 31, 1934.

# Buckeye Bumpers Name of Auto-Lite's New Company

Buckeye Bumpers has been selected as the name for the Springfield, O., bumper plant of The Electric Auto-Lite Co. Officers of the newly formed company are: C. M. Adams, president; Byron F. Fortier, vice-president and general manager; and W. V. Flood, secretary and treasurer. Associated with these officers are the following department heads and members of the executive personnel: Thomas MacDonough, Frank Leader, Paul Lohnes, Hugh Chrisian, W. W. Wilson, Joseph Linder, Richard Malone and Frank N. Martin.

#### Boeing Aviation School Marks Sixth Anniversary

Boeing School of Aeronautics is celebrating the sixth anniversary of its founding. At present the school occupies about 45,

000 sq. ft. of floor space in two hangars at the Oakland, Calif., Municipal Airport. Originally only about one-quarter of this area was used. Enrollment, officials state, has maintained a steady level and the course of study has been constantly broadened to meet advancing and changing aeronautic requirements.

# Mack Truck Awarded NYC Order for 20 Fire Pumps

An order for twenty 1000-gallon double combination fire pumps has been placed with Mack-International Motor Truck Corp. by the City of New York. The award was made under new and exceptionally stringent specifications issued by John J. McElligott, fire commissioner and chief of the Fire Department of New York. The specifications call for a delivery of 1000 g.p.m. at a pressure of 160 lb. per sq. in.; 500 g.m.p. at 320 lb.; 400 g.p.m. at 400 lb., and 250 g.p.m.

#### U.S.War Department Orders 74 Trucks from Federal

Federal Motor Truck Co. has received an award from the War Department for 74 trucks, cabs and bodies. Federal officials announced that with completion of this order the company will have furnished the War Department with more than \$1,000,000 worth of motor vehicles during the past 12 months.

Sixty-six of the trucks in this latest fleet will be equipped with enclosed drivers' cabs, 9 ft. dump bodies and hydraulic hoists. The remainder will also have enclosed cabs but will be equipped with army cargo type bodies fitted with tarpaulin tops and troop seats. Tire equipment will be pneumatic.

#### Willys-Morrow Plant Sold for \$300,000

The Willys-Morrow Co., plant at Elmira, N. Y., has been sold to the Elmira Industries, Inc., a civic group interested in rehabilitation of the industries of that city, according to David R. Wilson, receiver for the Willys-Overland Co.

There was only one bidder and the upset price of \$300,000 fixed by U. S. Judge George P. Hahn in Toledo District Court was the bid price. The sale will go before

the court for confirmation.

Originally the Elmira group bid \$250,000 for the plant property, but objections from bondholders brought a new minimum price set by the court.

#### Budd Employing 5500 Men, Largest Total Since '33

An increase of 30 per cent in the number of its employees, compared with this time a year ago, is reported by the Edward G. Budd Manufacturing Co. The company's payroll of 5500 men in the Philadelphia plant, of whom 1100 have been engaged in the last three weeks, is the largest since 1933, according to Dr. Edwin H. McIlvain, director of personnel. Dr. McIlvain said prospects are that employment in the Budd plant will average at least 6000 through the

#### National Battery Makers Elect Raycroft President

At the annual convention of the National Battery Manufacturers Association held recently in Chicago the following officers were elected: L. B. F. Raycroft, Electric Storage Battery Co., president; L. N. Talkes, Cleveland Storage Battery Co., first vicepresident; F. C. Kroeger, Delco-Remy Corp., second vice-president; O. L. Schutz, Grant Storage Battery Co., secretary, and L. A. Doughty, Carlile and Doughty, Inc., treasurer.

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The association adopted provisions barring the employment of persons under 16 years of age in the industry, and the employent of those under 18 in factory work. No female should be employed in any department where there is an appreciable lead hazard. Other labor, wage and hour recommendations were left to the discretion of the association's directors.

#### Cab Owners Elect Hubler

R. L. Hubler, general sales manager of the Ohmer Register Company, Dayton, Ohio, was elected president of the National Association of Taxicab Owners at the twenty-first annual convention of the association held recently in Chicago.

#### Extra Budd Wheel Dividend

Directors of the Budd Wheel Co. have declared a dividend of \$7 a share on the company's preferred stock, payable Nov. 30, to stockholders of record Nov. 18, 1935. A dividend of \$3.50 was paid Sept. 30 and an additional \$7 dividend has been declared for payment Oct. 31.



Fred S. Kimmerling, left, AC president, opens company's bowling club season, bowling the first ball. Charles Geatty, club leader, is shown at the right

#### Four Directors Added to Republic Steel's Board

Republic Steel Corp. directors have added four men to the board, elected two officers, appointed managers for mine properties and extended the time for exchange of Truscon Steel Co. stock for Republic shares.

New directors elected are: Donald B. Gillies, former president of Corrigan-Mc-Kinney Steel Co.; Oscar L. Cox, liquidator of the Union Trust Co. of Cleveland; Harvey H. Brown, Jr., of Harvey H. Brown & Co., and H. K. Bourne, vice-president of

Oglebay-Norton & Co.

Mr. Gillies was elected vice-president and Edward G. Resch, assistant treasurer. Expiration date of the offer to exchange Republic stock for Truscon was advanced to Oct. 21. John E. Nelson was appointed manager of Republic's mining properties. He will have charge of eleven active mines in Michigan and Minnesota.

#### Ford of Canada '36 Trucks Feature Chassis Refinements

Ford of Canada has announced its commercial line for 1936, featuring refinements in chassis detail. The Ford V-8 powerplant remains unchanged. The line now comprises DeLuxe and Standard models of 11/2-ton and 2-ton trucks, the 2-ton deluxe being a new model with dual rear wheels and auxiliary springs. These commercial models include a light delivery, deluxe panel delivery, station wagon and sedan delivery bodies on a chassis of 112-in. wheelbase. A factorybuilt steel-panel body is available on the 1½-ton, 131½-in. chassis.

Two-ton truck models are mounted on 131½ and 157-in. wheelbases. Powerplants of the 1½-ton truck have an 80-hp. rating, the 2-ton is rated 90 hp. Front-ends have been redesigned to give a more massive appearance. A change has been made in the steering linkage to reduce tire wear on turns and crowned roads, the caster angle having been increased 4% deg. The camber is reduced to ¾ deg. By the addition of eight needle bearings, four in each universal joint, the anti-friction bearings have been increased in number to 39. The full-floating rear axle is continued, but the axle shafts have been increased in diameter, and the joint between the axle shaft flange and the hub has been made more secure. A new 19-in, fan is mounted close to the radiator

#### Studebaker Transfers Hewins

M. E. Hewins has been appointed zone manager of the New York and New England territory of the Studebaker Co. He joined the Studebaker organization a number of years ago in San Francisco as district manager.

#### Bondesen Promoted by AC

Appointment of Eskild Bondesen as comptroller of the AC Spark Plug company has been announced by Fred S. Kimmerling, president and general manager of the com-

#### CALENDAR OF COMING EVENTS

#### SHOWS

New York Automobile Show, New York, Nov. 2-9 Baltimore Automobile Show ..... Nov. 2-9 San Francisco Automobile Show. Nov. 2-9 San Francisco Automobile Show, Washington, D. C. Automobile Show, Nov. 2-9 Detroit Automobile Show ...... Nov. 9-16 Buffalo Automobile Show .......Nov. 9-16
Indianapolis Automobile Show...Nov. 9-16 Newark Automobile Show ......Nov. 9-16 Cincinnati Automobile Show ....Nov. 10-16 Pittsburgh Automobile Show.....Nov. 11-16 Philadelphia Automobile Show. Nov. 11-16 Toledo Automobile Show ......Nov. 15-21 Chicago Automobile Show ......Nov. 16-23 Portland, Ore., Automobile Show. Nov. 16-23 Minneapolis Automobile Show.... Nov. 16-23 Columbus Automobile Show .... Nov. 22-28 Cleveland Automobile Show .... Nov. 23-30 Montreal Automobile Show ..... Nov. 23-30 Peoria, Ill. Automobile Show. . Nov. 27-Dec. Peoria, III. Automobile Show, Kansas City Automobile Show, Nov. 30-Dec. 6 Milwaukee Automobile Show. Nov. 30-Dec. 7

CONVENTIONS AND MEETINGS Industrial Materials Exhibit, Hotel
Astor, New York .......Oct. 21-25
S.A.E. Annual Dinner, New York ....Nov. 4
SAE Annual Meeting, Detroit,
Jan. 13-17, 1936

# The Horizons of

## The Reproach of Conservatism

VIGOROUS correspondent takes us severely to task for a discussion of unemployment which appeared in the October 5 issue of Automotive Industries. The article was preceded by another in the previous issue which used as its text the assertion of our chief executive that complete business recovery would still leave the total of unemployed at or near its present level.

The article which provoked our correspondent made the point that permanent unemployment on the present scale is probable only if the government maintains a minimum price for labor, in the form of relief or caterpillar counting wages, above the value of such labor in the open market.

#### Range of Ability

The value of labor varies with business conditions and with the economic merit of the particular worker. Human ability ranges across a broad scale. Joe Louis gets a quarter of a million for the neat performance of an evening chore. A preliminary pug who took infinitely more punishment and worked much harder than the "brown bomber" received \$50. This discrimination was not the fruit of the promoter's avarice,

the poor bargaining power of the preliminary fighter or the sordid seams in capitalism. Judged by consumer gratification the "dark destroyer" was underpaid and the hardworking third rater, untouched by fistic genius, received more than he was worth.

#### The PPA

Assume now that a government oozing solitude for impoverished pugs should establish a minimum fee for fighters, e.g., \$100. To give effect to this laudable purpose the PPA (Punk Pug Administration) is organized. It swings into action with the customary New Deal fanfaronade. The poor preliminary fighters are also consumers. If they are not adequately paid they will be unable to buy their quota of shirts, bread, billiard balls, yea, even tickets for other prize fights. In order to absorb the products of other workers, including prize fighters, it is absolutely necessary that all poor pugs receive sufficient purchasing power to maintain consumption at a healthy level.

This argument is stereotyped. It has come from Washington on hundreds of occasions as the feeble rationalization of some experiment which violated all experience. True, it has never been applied to fighters. Some unregen-

erate conservative may suggest that the number of third rate gladiators who vote is insignificant. We reject the suggestion as unworthy and irrelevant.

### Unemployment in the Cauliflower Industry

We are interested here solely in the welfare of the mediocre professional scrapper. If the PPA establishes a \$100 minimum for all fighters, will this solve the problem of underpaid pugs? It will if the government goes one step further and forces fight patrons to attend bouts in numbers and at prices which will make it possible to pay minimum fees to contestants. Barring this drastic ultimate step fighters who are not good enough to draw a crowd that will justify the minimum purse will receive no engagements. They will remain unemployed.

Suppose now that the PPA takes the next traditional step and assures these unemployed pugs an equivalent compensation in the form of outright dole or as payment for exhibition "fights" in CCC camps. How long will the country have an unemployment problem in professional pugilism? Just as long as the Government continues to maintain an upset price for idle labor above its natural earning ability.

#### The Bottom of the Scale

The public fails to realize the proportions of those unfortunates whose services place them at the bottom of the economic scale. According to careful studies made by the Brookings Institution there

# Business

were 49,041,000 income recipients in 1929. Of these 5.075.600 received less than \$500 for the year. Bear in mind that this is the most prosperous year in American industry, that the market for labor, i.e., the demand for human services was, with the exception of war periods, better than it had been at any time in the past. Nevertheless under these most favorable circumstances approximately one worker out of every ten was unable to earn an annual income equal to that which a generous government today pays the most inefficient boondoggler. If Harry Hopkins offers the idle "jobs" at \$60 a month he is virtually serving notice on the country that all those who thus labor will be removed from the market until such time as industry, trade or agriculture can meet the minimum upset price and security of the relief wake.

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#### Not a Question of Motive

There is no desire here to criticise the men and women who take advantage of this arrangement. Nor is there any wish to ridicule the motives of the social workers who establish abnormal compensation levels for the least able members of society. Sincere sympathy may be extended to all the third rate preliminary fighters in a tough world who can never hope to become "sepia sluggers," Jack Dempseys or Gene Tunneys. The fickle dice of procreation simply do not roll that way. The question that we must raise and answer are not directed to moral merit or high social purpose. Will artificial regulation of compensation work?

#### By Joseph Stagg Lawrence

Are the evils which attend such efforts greater than the faults which they seek to cure?

#### A Practical Problem

These questions should be answered in the liberal spirit, i.e., by the direct application of disinterested intelligence and experience. Will it work? Can the government maintain a minimum income for millions of citizens which they were never able to earn even in the most prosperous years? The attempt is forcing the Government to spend twice as much as it can collect in revenue. To continue indefinitely along the present course will destroy the credit of the state just as certainly as it will debauch the beneficiaries (?) of government kindness. These recipients are by no means content with their lot. A thirty hour week leaves them ample time to churn their grievances under the goading of agitators. There are strikes of relief workers in New York, in Buffalo, in Trenton. Can any one with the most elementary knowledge of human nature believe it possible for the government to establish and pay a satisfactory compensation? At what level shall it be fixed in order to solve the social conscience of the

That arch social saint, Guy Rexford Tugwell, has proposed a minimum of \$2.000. The question is not "Should every worker get at least \$2,000?" but "Can every worker get \$2,000?" In 1929 four out of every five income recipients were getting less than \$2,000. The national income in that year was \$93 billion. This is a round figure and includes imputed income. A comparable figure for 1935 may be estimated at \$52 billion. Thus 1929 and 1935 are separated by \$41 billion. Having reached the 1929 figure another \$39 billion will be necessary in order to raise the income of all those receiving less than \$2,000 up to that figure.

#### The Essence of Conservatism

If you think that the government can and should do this then you can logically approve almost everything that the New Deal has attempted. For our part we are in favor of higher incomes for every one. We are opposed to poverty. We deplore sin, selfishness and thundershowers on afternoons. If our conviction that these laudable objectives do not fall within the possible province of any government be it ever so wise, ever so powerful, ever so incorruptible makes us a conservative we admit the reproach.

# Plymouth Improves Its Suspension for the



The four-door sedan of the new Plymouth line

ETAIL changes in chassis units and bodies, making for greater comfort and safety, are the outstanding features of the Plymouth line for 1936, which is available in three "business" and seven "deluxe" body types, all mounted on the 113-in. wheelbase chassis.

The time-tried six-cylinder engine of 3%-in. bore by 4%-in. stroke is continued unchanged with full length water jackets, exhaust valve seat inserts, and "floating power" mounting. A special oil filter is used. Aluminum-alloy pistons with four rings are standard, the surface of the piston being anodized by the process introduced at Plymouth last year. The use of rubber has been increased greatly, the Plymouth now

having more than 400 mechanical rubber parts, totaling over 40 lb., exclusive of the rubber in the airwheels.

Body interiors are roomier and more comfortable, with 4½ in. more passenger space lengthwise and about 2 in. more elbow and shoulder room. The safety steel body, reinforced for additional strength, is insulated from the frame with sound-deadening rubber.

Style changes produce a distinctly new exterior appearance. The long, low contours of the body sweep back from a modernistic radiator grille, which is set off with bright chromium vertical bars on either side, the center section of vertical bars being finished in body color

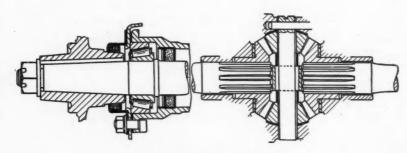
Deluxe two-door sedan models have

been improved in interior design. Front seats of these models are no longer bucket-type, but extend the full width of the car. The seat back is divided in the center.

Bodies, fenders, and small sheet-metal parts are rustproofed to protect the finish. A new high-gloss synthetic enamel has been adopted for body finish this year. It is said to be more durable than those previously used, and its adoption followed the installation of new paint-shop equipment and the development of a new technique in recent months.

Mechanical changes include an entirely new frame, improved steering geometry in conjunction with a change in front suspension, and redesign of the rear axle which now has only one large Timken roller bearing instead of two lighter ones.

By the adoption of 5½-in. side rails, which added only a few pounds to the weight, the torsional rigidity of the frame has been doubled. The X-members have been redesigned to form an integral unit and the ends are now welded to the side rails. Strength has been added at the front by the use of a heavy-gage straight cross-member instead of the customary Y-member. In addition, the frame is shaped to con-



Plymouth rear axle details

# Steering Gear and Front New Year

form to the contour of the body so that the final assembly takes advantage of the stiffness imparted by the body structure.

The tapered-leaf front springs, consisting of 10 thin leaves, are now shackled at the front. A steering shock eliminator is mounted at the rear of the left front spring.

The ride stabilizer has been improved by mounting it on the shock absorbers instead of attaching it directly to the front axle.

Plymouth engineers have developed a new form of "shockless" steering mechanism with a fore-and-aft drag link. Axle movement follows the arc of a circle with the center of the circle at the rear of the front spring mounting. Thus, the arc described by the axle is practically the same as that described by the forward end of the drag link.

The steering gear is of the worm-androller type, with two tapered roller thrust bearings and a roller bearing on the roller teeth. The steering-gear ratio is unusually high, 18.2 to 1, and this feature, combined with the liberal use of anti-friction bearings, makes the car easier to handle under all driving

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conditions. The steering column is adjustable.

The body is cushioned on rubber for the first time. Rubber shims are placed between the body and frame to prevent telegraphing of road noises. The use of a metal cap, replacing fabric over the differential clearance opening, further aids in preventing noises from reaching the interior. There is no body rumble even on cobble-stone pavements.

Rubber spring bumpers are fitted between the axle and frame, long enough to serve as additional shock absorbing units on rough roads. Rubber is used in the body around the doors, windows and windshield as a seal against drafts, dust and dirt.

The body has been reinforced for rigidness. The front corner post has been redesigned and now has a "box section" over its entire length. A bracket from the front of the dash to the frame has been added. Front doors are strengthened by gusset plates at

the front corners. The center pillar of "box section" has a heavier and more rigid bracket at its lower end, welded to the post and bolted to the frame.

The trunk is larger and is provided with a new cam-type trunk lock that cannot be forced open by a wedge. Sedan models not equipped with trunks have roomy luggage compartments behind the rear-seat cushion. In closed coupe models, the spare tire has been removed from the rear and now is tucked away in a space behind the rear

Interiors have been restyled, with bright shades and patterns for the upholstery and trim. Doors are embossed with vertical lines matching the pleats of seat cushions. The instrument panel is patterned with the same vertical effect. Instruments are grouped within the face of a large airplane-type speedometer so the driver can see all the indicators at a glance.

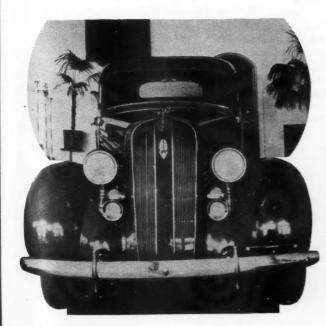
In deluxe sedan models, ash trays are inserted in the forward ends of the arm rests. A rear compartment foot rest built into the back of the front seat in deluxe four-door sedan models has the effect of adding three inches more leg room. Plymouth retains its ventilation system with one important change. In deluxe four-door sedan models, the rear quarter windows now swing out to draw air out of the car at the rear and are operated by a simple friction

On all truck models an X-bracing of steel across the back of the rear seat is used to increase body rigidity.

The hand-brake lever is mounted directly on the frame, making it more rigid than before.

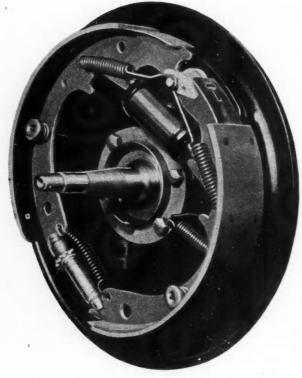
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The front of the 1936 Plymouth presents new lines

# "Duo Automatic Hydraulic Innovation



Hydraulically operated front brake mechanism used on Hudson cars for 1936, showing broad brake shoes and efficient operating mechanism

UDSON MOTOR CAR COM-PANY is again offering a line of Hudson Sixes and Hudson Eights. The new lines, both of which are in the low-priced field, are mounted on chassis of longer wheelbase and wider treads. Each line comprises a two-passenger coupe, brougham, touring brougham, four-passenger coupe, sedan, touring sedan, and convertible coupe. The eight comes in both Cus-

tom and DeLuxe models, and the sedan and touring-sedan bodies of these lines are mounted on 127-in. wheelbase chassis, while the remainder of the bodies of the eight-cylinder lines are mounted on chassis of 120-in, wheelbase. This is also the wheelbase length of the entire line of six-cylinder cars.

The principal improvements in the Hudson line for 1936 include the fol-

"Radial safety control," consisting in the provision of torque arms between the front axle and frame.

"Automatic draft elimination," the provision of an air inlet to the body located in the floor over the rear axle and covered with a filtering cloth.

"Duo automatic hydraulic braking," an arrangement whereby the brake pedal applies the emergency brake after having passed through threefourths of its travel.

A steel body with roof all in one

Extensive noise insulation of the body.

The six-cylinder engine has 3 by 5-in. cylinders; it is rated at 93 hp. at 3800 r.p.m. with the standard head giving a compression ratio of 6.25 to 1, and at 100 hp. at 3800 r.p.m. when equipped with an aluminum cylinder head giving a compression ratio of 7 to 1. The eight-cylinder engine has 3 by 41/2-in cylinders; it is rated at 113 hp. at 3800 r.p.m. with the standard head, giving a compression ratio of 6 to 1, and at 124 hp. at 4000 r.p.m. when equipped with an aluminum cylinder head giving a ratio of 7 to 1. Aluminum cylinder heads are optional at extra cost.

The standard rear-axle ratio is 41/9 to 1, but optional ratios of 38/9 and 35/9 to 1 are available. The Six carries 6.00-16-in. tires, the Eight, 6.25-16. Brake drums are of 10 1/16-in. diameter on the Six, 11 1/16-in. on the Eight. To take care of the wider bodies the rear tread has been increased to 57½ in.

In appearance the new Hudsons are



October 26, 1935

Hudson Eight Cylinder Sedan. A full six-passenger body completely built of steel mounted on a 127-inch wheelbase, with a 113horsepower engine

Automotive Industries

# Braking" a Hudson for 1936 Line

They are distinguished by long, low lines; deeper, one-piece fenders; a new die-cast radiator grille, increased curvature of the one-piece roof, and increased slope at the rear.

Sedan bodies are 50 in. wide in front, 49 in. in the rear. At shoulder and elbow height, above the arm rests, the width is 56 in., and leg room has been increased as a result of the increase in wheelbase.

The front suspension has been greatly improved by making the front springs much softer and providing means for positively guiding the movement of the front axle. The axle is connected to the chassis frame by two drop-forged torque rods. These permit the front axle to rise and fall freely, and also to deviate from the horizontal position on uneven roads. A lubricated vertical pivot pin at the forward end of the torque rod and a rubberbushed pivot bearing at the rear end permit transverse movement of the front axle due to thrust on the wheels. The rubber bushings in the pivot bearings insulate the frame and body against road shock. Because of the provision of the torque rods, the sole duty of the front springs is to support the car flexibly. They are shackled at both ends and are mounted on the axle by means of a lubricated saddle bearing which fits around a cylindrical machined portion of the axle. The torque arms maintain the proper caster of the front axle. Because of the softer front suspension, two main leaves are used; that is to say, the spring eyes are formed by wrapping the ends of two leaves. The flexibility of the front springs has been more than doubled, the rate now being 110 lb. per in., as compared with 235 lb. per in. last year.

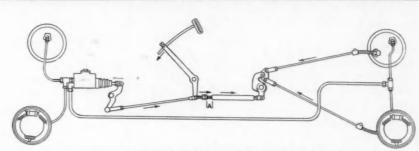
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A new ventilating system has been provided on the cars. Fresh air is drawn into the body through a "draft eliminator," an opening in the floor of the body over the rear axle, which is covered by a screening cloth.

Much has been done to improve the noise insulation of the cars. Muffle-

board, a fibrous material, is cemented against the inner roof of closed bodies. Strips of Masonite are placed loosely, side by side, beneath the muffle board, and soft blue wadding is placed between the Masonite and the top bows. Both the blue wadding and the Masonite are loose materials. Beneath the

Another new feature of the Hudsons is the Duo-Automatic braking system. Every emergency application of the hydraulic brake is backed up by a mechanical application which becomes operative when the pedal has been moved through ¾ its range, or in the event the hydraulic brake fails. The



Diagrammatic sketch of Hudson dual-hydraulic brake for 1936, showing pickup link at "A" which actuates mechanical reserve after proper amount of pedal travel for hydraulic brake application

top bows is an inner lining which functions as interior trim.

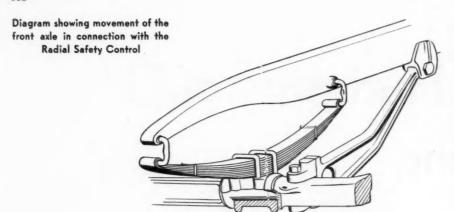
Muffleboard is also cemented against the flat door panels and other flat surfaces throughout the body. To keep out engine noises, ¾-in. kersey cloth is cemented to the cowl panels. Behind this kersey pad is the wiring of the car, over which is placed another ¼ in. of kersey and then a ¾-in. corrugated board. Over the corrugated board is the dash finish panel of embossed laminated board.

The floor is covered with 4-in. kersey cloth, and this, in turn, is covered by the carpet. Under the seat a 1/8-in. kersey pad is cemented to the floor, while under the rear deck a sound-deadening material known as muffle matting is applied. All seams and joints throughout the body have a coating of rubber air sealing compound.

first part of the travel of the pedal applies the hydraulic brake. After a certain movement, the pedal picks up a link connected with the mechanism that applies the emergency brake to the rear wheels.

Improvements have been made also in the engine cooling system. When the engine is cold, the water does not pass through the radiator but is bypassed around it. With the new layout of the cooling system the flow to the car heater (if one is installed) is more effective. The pump is now of the packless type, its shaft being surrounded by a spring-loaded, graphite-impregnated cork washer. A stainless steel washer and coil spring back up the cork washer, while another stainless steel washer acts as spring retainer.

The Carter carburetor is now equip-



ped with an anti-percolating device, designed to prevent vapor lock in the float bowl. A spring-loaded needle valve in the float bowl opens when the throttle is closed, permitting any vapor that may form to escape. Valve stems have been increased in diameter from 5/16 to % in. The clutch vacuum cylinder has been increased in length to increase the travel of the clutch mechanism and provide a better timing for gear shifting. The "Electric Hand" bracket on the steering column has been given a streamline form to match the interior treatment.

Generator characteristics have been improved, so that the charging rate is maintained at high car speeds. It is an Auto-Lite unit of the voltageregulated, fan - cooled type. Wider gears are used in the transmission, and the chamfer of the teeth has been improved.

A water-temperature indicator has taken the place of the water-level gage on the instrument panel.

More space is now available in the tire and baggage compartment in the rear of the body. The tire is now carried flat, instead of in an upright position. When is trunk is installed, a special trunk door replaces the compartment door, and with the tire carried in fender well the storage space amounts to 21 cu. ft. A special locker for tools is provided in either the trunk or baggage compartment.

On the Hudson Six, the seat cloth is a worsted boucle in green-gray. As an option there is a brown-black 100

per cent mohair with green-gray pile. The side walls are in worsted boucle and the headlining is colored to match the side walls. The upholstery and trim on the Special Eight is the same as that on the Six. On the Deluxe Eight the seat cloth is an all-wool two-way twist, with 100 per cent mohair optional. The side wall is also on all-wool faced knitted fabric in mixed colors with mohair optional. The headlining matches the side walls.

In the lighting system, the intensity of the "passing beam" has been increased from approximately 25,000 to more than 50,000 c.p. This improvement was accomplished by a relocation of the bulbs to take better advantage of the reflector and the lens. The passing beam is deflected at a 3-deg. angle to illuminate not only the road shoulder, but also the ditch. The driving-beam candle power remains approximately 50,000 and the illuminated distance is 700 to 800 ft. A light in the instrument panel serves as a signal to the driver that the headlamps are functioning properly.

A 6-tube radio is offered as optional equipment. The control is a part of the dash layout. The antenna for the radio is stone and weather-proofed and is mounted beneath the car between the running boards. To compensate for the insulation of the steel body the radio set has been designed to give high output.

### VESTPOCKET DIESEL MANUAL

Vestpocket Diesel Manual. Published by Diesel Publications, Inc., 192 Lexington Ave., New York.

THIS little book contains a good deal of fundamental information on Diesel engines, covering the principles of the engine, the calculation of horse power, Diesel engine types, applied combustion, fuel injection, structural characteristics, engine cooling, valve and scavenging systems, starting and controlling, lubrication and general hints for the operator. The book evidently is intended for the operator and is without illustrations.

## Propose Cars Without Reverse

Some rather fantastic suggestions have been made in connection with the development of a small, cheap two-passenger car by the French Society of Automobile Engineers. As the selling

price has been set at a low figure a favorite suggestion is to leave out parts that have been considered necessary up to the present. One proposal provides for the elimination of the spare wheel, which seems to cost too much and also to weigh too much. Another project

provides for the elimination of the transmission or change-speed gear, but the most radical of all eliminates the reverse gear by driving through a single wheel and swinging that around through a half circle when the car is to be run backward.

#### Plymouth Has New Front Suspension

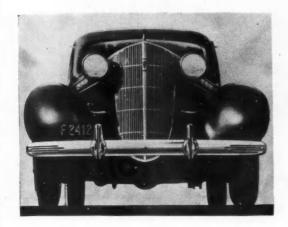
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Non-glare lighting is accomplished with a new pre-focused bulb which has two horizontal "bar" filaments located side by side, one slightly above the other. Lens and reflector are specially designed for these bulbs.

A "fog cap," or opaque coating on the

end of the bulb, provides more penetrating beams for bad-weather driving. The coating eliminates the direct rays from the filament, which normally are reflected by water and dust particles in the line of vision above the main beam.

# Olds Adopts Aluminum Pistons and Improves Engine Mounting



The frontal appearance of the Olds models present new lines

LDS is entering 1936 with two lines—the six, and the straight eight—with proved mechanical features basically unchanged, but improved in detail, and with refinements in exterior and interior body treatment.

The six is mounted on a 115-in. wheelbase chassis, the straight eight on one of 121-in. Safety glass is fitted all around.

All seven body styles are continued. They include a four-door touring sedan and five-passenger touring coupe, both with trunk; four-door sedan, five-passenger touring coupe, business coupe, sport coupe, and convertible coupe. In 1935, trunk models were the most popular in the entire line, the greatest

demand having been for the four-door touring sedan.

Powerplants are continued unchanged except for refinements. The F-26 has a sixcylinder  $3\frac{\pi}{16}$  by  $4\frac{\pi}{6}$ -in. (213.3 cu. in.) engine

The Oldsmobile e i g h t touring sedan has the headlamps mounted at the side of the radiator grille. The long hood comes right up to the radiator grille and wing ornament.

rated at 90 hp. at 3400 r.p.m., with castiron head and 6 to 1 compression ratio. The L-36 has an eight-cylinder, 3 by 4¼-in. (240.3 cu. in.) engine, rated at 100 hp. at 3400 r.p.m., with cast-iron head and 6.2 to 1 compression ratio.

For 1936, the pistons of both the six and eight are of aluminum, hard surfaced by anodizing. Engine performance has been improved by the use of the light pistons and heavy counterweighted crankshafts. New engine mountings feature the use of a soft rubber core and interlocking channel sections which produce a soft torque cushion. Clutch chatter and fore-andaft movement of the engine are said to have been practically eliminated.

Bodies incorporate the solid steel turret top, split windshield, and streamlined rear contours. Olds, the originator of the die-cast radiator grille, presents an entirely new die-cast grille, so mounted as to make the radiator easily accessible. High mounting of the headlamps on the radiator shell adds further to the distinctive appearance of the new models.

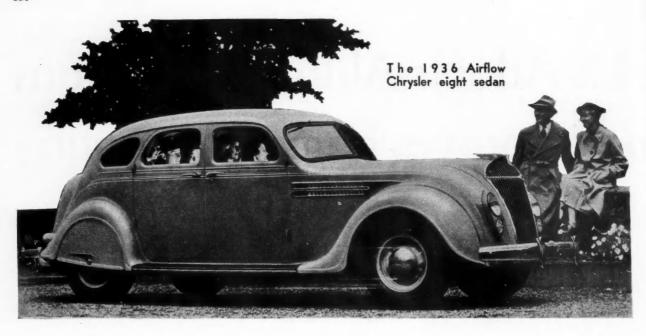
Unsprung weight has been materially decreased by the use of improved lower control arms on the front-end suspension. The hand brake is mounted on the left-hand side of the cowl, increasing the roominess of the front compartment. Mounting the lever on the cowl eliminates the floor-board opening, thus lessening the possibility of entrance of dirt and noise.

Positive lubrication of cylinder walls is achieved by drilling a hole in the side of the connecting rod, from which oil is squirted just before the piston reaches top center. Vacuum-controlled spark advance is another feature.

A new starter control consists of a plunger extending through the dash just above the accelerator pedal. When

(Turn to page 558, please)





# by Joseph Geschelin Detroit Technical Editor

# Four Chrysler Models for Have Longer, Stronger

OUR entirely new models featuring advanced styling and many mechanical improvements comprise the Chrysler line for 1936. In detail, the line consists of the Chrysler Six, Model C-7, in six body styles; Deluxe Eight, Model C-8, in seven body styles; Chrysler Airflow Eight, Model C-9, and Chrysler Airflow Imperial, Model C-10, both in two body styles.

The Chrysler Six, on a 118-in. wheel-base chassis, comes in the following body styles: Touring sedan, touring brougham, business coupe, rumble-seat coupe, convertible coupe and convertible sedan.

The Deluxe Eight, mounted on a 121-in. wheelbase chassis, comes in touring sedan, rumble-seat coupe, convertible sedan and convertible coupe. A traveler sedan, seven-passenger sedan and seven-passenger sedan-limousine are mounted on a 113-in. wheelbase chassis, this model having a 110-hp. engine as standard equipment.

The Chrysler Airflow Eight, 123-in. wheelbase, and the Chrysler Airflow Imperial Eight, 128-in. wheelbase, are made in six-passenger sedan and coupe body styles only.

Powerplants of all four models are continued unchanged, except for detail improvements. The Chrysler Six en-

gine has a 3%-in. bore and a 4½-in. stroke (241.5 cu. in. displacement). With the standard compression ratio of 6 to 1 it develops 93 hp. at 3400 r.p.m.; with a 6.5 compression ratio, 100 hp. at 3400 r.p.m. Aluminum heads are fitted.

The Chrysler Deluxe Eight engine has a 3¼-in. bore and a 4½-in. stroke, which makes the displacement 273.8 cu. in. With standard head and 6.2 to 1 compression ratio its output is 105 hp. at 3400 r.p.m., with special aluminum head and 7.0 to 1 compression ratio, 110 hp. at 3400 r.p.m.

The Airflow Chrysler Eight engine is of 3½-in. bore and 4%-in. stroke (323.5 cu. in. displacement) and develops 115 hp. at 3400 r.p.m. with standard compression ratio of 6.2 to 1, and 120 hp. with a 6.5 to 1 compression ratio. With the same bore and stroke, and with 6.5 to 1 compression ratio, the Airflow Chrysler Imperial Eight engine develops 130 hp. at 3400 r.p.m. with aluminum head, and with a 7.45 to 1 compression ratio, 138 hp. at 3400 r.p.m.

An automatic overdrive is available at extra cost on both the Six and Deluxe Eight. These models also have hypoid rear ends and larger and stronger X-frames with twice the tor-

sional rigidity of former designs. Rubber insulation between frame and body is found on both models. Full-length water jackets and a water distributing tube are new features of the Six

Deluxe Eight and Six bodies embody many changes. Bumper-to-bumper length is increased, while the roof height is cut by 1 in. Interiors now provide 4 in. additional elbow room, and both models are equipped with new windshields. Other body features common to all Chrysler models include a new ventilating system, built-in trunks on all sedans, foot rest integral with front seat, completely adjustable; full-width front seats in all two-door sedan models; larger rear-quarter windows, and spare tire carried in body compartment.

Pantagraph wheel suspension, introduced last year, is standard on the Six and Deluxe Eight. Hydraulic brakes with centrifuse drums are continued on all models. A vacuum power cylinder for brake operation is standard equipment on the Airflow Imperial only.

All models sport smart new radiator grilles of die-cast construction, set off by unique hood louvers of different form for each model. The wings of the

Chrysler emblem have been worked artistically into the chromium bars near the top of the grille. Grilles of harmonizing design cover the horn recesses below the headlamps.

Butterfly wings in the front windows, and the outward swinging rearquarter windows of all four-door Sixes, Deluxe Eight, and Airflow Chrysler sedans afford "diffused ventilation," adjustable for the comfort of each passenger.

New treatment of drip mouldings and window reveals, and the new rear luggage compartment, now a feature of all sedans, add to the appearance of lowness and to the pleasing effect of the flowing lines. Fender beading, treatment of the molding which completely encircles the radiator grille. the

The whole body structure of the Six and Deluxe Eight has been strengthened. The steel front-corner pillar has been made more rigid by a new box construction. It is braced in the strengthened cowl and instrument panel design. The steel center pillar, also of box construction, is more rigidly braced, and X-bracing has been added beside the rear seat cushion to stiffen the body structure. The steel doors have been stiffened by added gussets. A new double dovetail design, in combination with the door lock, reduces likelihood of any play that might lead in time to , the body from the frame. squeaks and rattles.

Visibility has been improved by raising the molding at the upper edge of the windshield, while the steering wheel has been lowered and its angle changed. In the new Airflow instrument panel, the large speedometer and other instruments are regrouped and set off in colors to harmonize with the interior trim. The outer large figures on the speedometer face indicate car speed, while two additional sets of figures nearer the center indicate engine r.p.m. for standard direct drive and for the overdrive, emphasing the advantages of the latter feature. The instru-

and sedan rear windows are divided. ment is thus both a speedometer and a tachometer.

The driver's seat is now "all adjustable." In addition to moving forward and backward, as in conventional design, it can be raised or lowered at the front by a turn or two of a crank. raised or lowered at the back, or tilted forward or backward.

The bodies of the Six and the Deluxe Eight are secured to the frame by both vertical and horizontal bolts. New rubber-and-fabric-composition shims, extending the width of the top flange of the frame and down the side, insulate

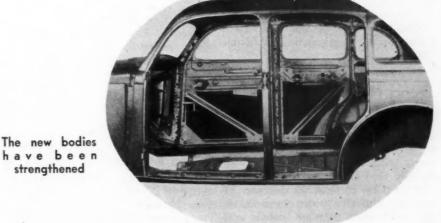
Spring leaves are of "Amola" steel, heat treated. Thinner leaves with tapered ends increase flexibility and distribute the leaf-to-leaf load over wider bearing areas. Metal covers exclude water, mud and dust and retain lubricant. Shackles for the leaf springs and for the pantagraph linkage of the front springs are of the silent threaded type, while bushings for the eyes of the unshackled ends of the leaf springs are of rubber.

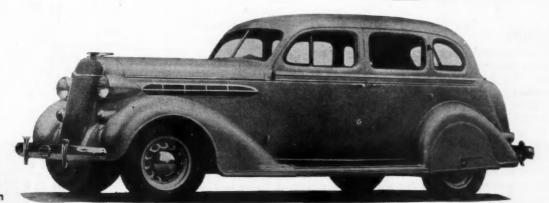
A redesigned steering linkage for the Airflow Chrysler models permits changes in angle of steering column and steering wheel.

# for 1936 Bodies

harmonizing chrome-plated die-cast grilles over the two horn recesses in the catwalk, and the mounting of the torpedo-shaped headlamps on the radiator shell, all add to the appearance of the Six and the Deluxe Eight.

In the driver's compartment, a fullwidth cushion, with divided full seat back, either section of which tilts forward, replaces the bucket seats of the two-door sedan or touring brougham. In the coupe, similar divided seat backs give easy access to the luggage and spare tire compartment. The large speedometer dials and other instruments have been more attractively arranged. Windshields are of the V-type,

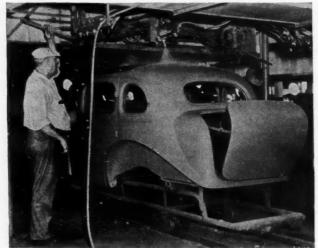




Chrysler six four-door sedan

Automotive Industries

October 26, 1935



Pontiac Division, General Motors Corp.

An unmasked operator is safe from "lacquer fog" with the use of this fixture in spraying roofs

#### Machine Standards it

In a report to the A.S.T.E., W. H. Smila, master mechanic at Chrysler, described a machine and tool data sheet that may prove to be a boon to tool engineers. The data sheet, to be published by the A.S.T.E., contains dimensional data on commonly used machine tools. It covers those dimensions that control the form and size of jigs, fixtures, dies, attachments, etc. Once the information has been accumulated, it will simplify the work of the tool designer during the hectic period of changeover. Data sheets on new equipment is a future project.

#### Good News

Some of the engines for 1936 will feature longer water jackets, better cooling. This is good news, no end to everybody concerned — bearingmen, oilmen, servicemen. It is claimed that crankcase temperatures will drop by at least 50 degrees, in one case almost 100 deg., and that's just the margin between trouble and good performance.

#### Ingenuity

We ran across a very ingenious device in a gas station just around the corner. You know how people drive in for service and if the attendent is not right there, they drive somewhere else. It has happened to you and to me. So this attendent built himself an automatic alarm. It consists of two metal tracks laid on the pavement on each side of the row of pumps, extending almost a car width on each side. When a car drives up,

it compresses the metal strip and completes a circuit wired to a bell in the office. Here's a business man who is right on the job.

#### Human Material

Following the current discussion of apprentice training as a means of developing skilled workers for industry, a study has been completed by the I.C.S. which is of great interest to personnel men. The results of the study are found in "The Related Instruction Problem," by D. C. Vandercook. The report is comprehensive, covering the scope of the personnel problem, scope of the instruction problem, individual differences, etc. Among other things, the report shows how training courses may be developed in conjunction with the I.C.S. program.

#### In the Making

How bearings are made is something of a mystery to most people, even to engineers. For this reason you may be interested in a handsomely illustrated bulletin by Fafnir, showing some of the operations in the making of Fafnir bearings. They will be glad to send you a copy—or ask us.

#### A. W. S.

Detroit has probably the greatest concentration of welding—arc, resistance, and whatnot—to be found anywhere in the world. Which brings us to the subject of the American Welding Society chapter in this town. We expect it to go places this year, both in membership and activities,

PRODUCTION LINES

under the guidance of John Tebben, of the P. R. Mallory Tebbens. Come out and support a good cause.

#### Latest Arrival

On the way through Lansing recently we stopped for a few minutes at the new Olds Fisher body plant which occupies the original Durant factory buildings. At quick glance, the thing that struck our fancy was the paint treatment throughout the plant. Here it is all done in white—ceilings and walls—with fresh green dadoes on walls and columns. Then too, all the service piping at the ceiling and elsewhere is finished in distinguishing colors.

Assembly lines are illuminated by the newest type mercury vapor bulbs, which produce little or no glare on the metal surfaces. Not only is this easy on the eyes but it makes it so much easier to find flaws.

Another of the new wrinkles is a pit along the body line to facilitate spraying of the underbody. One operator seals the underbody and coats it with the sprayed asphaltic deadening compound.

Turret tops are finished automatically by an ingenious device. This may or may not be the first of its kind, but it's the first we have seen this season. An automatically controlled paint spray nozzle sweeps across in a track which is shaped to conform to the roof contour, while the body moves through this station. The same arrangement is used for undercoats and finish coats. It is surely a logical development of turret top construction, although this solution is all the more outstanding because of its extreme simplicity. (See Pontiac picture above for illustration.)



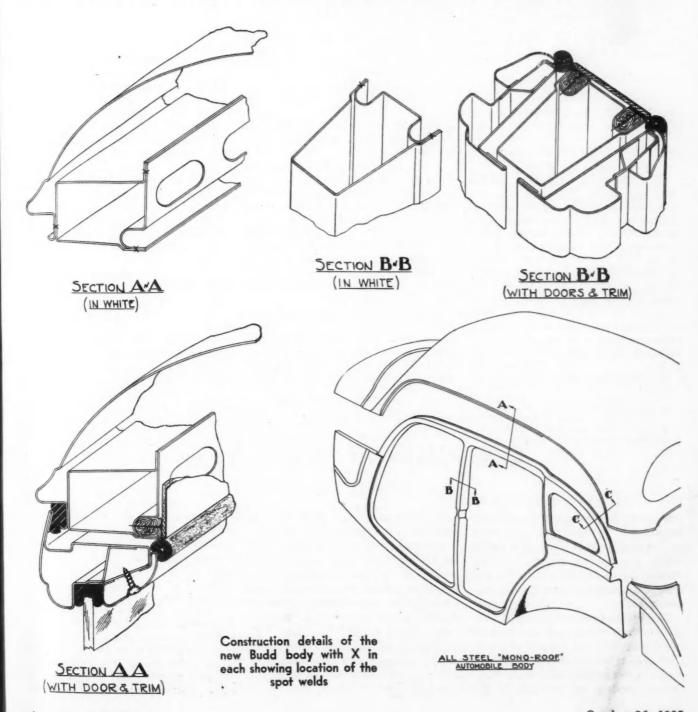
# Budd Develops New All-Steel Body

NEW type of all-steel automobile body assembled from four major units without the use of flashwelding has been developed by the Edward G. Budd Manufacturing Company, Philadelphia. Described as the "Mono-Roof body," it is designed to reduce the cost of shipping, assembling and finishing, to effect a substantial saving in weight, and to provide greater accuracy. It lends itself well to branch assembly.

In the Budd Company's first all-steel body, produced some 30 years ago for an open car, there were about 1200 parts that were welded and riveted together. In 1926 the company brought out a mono-piece steel body with soft roof center. Since then it has been experimenting with the new Mono-Roof body which is assembled from four major units.

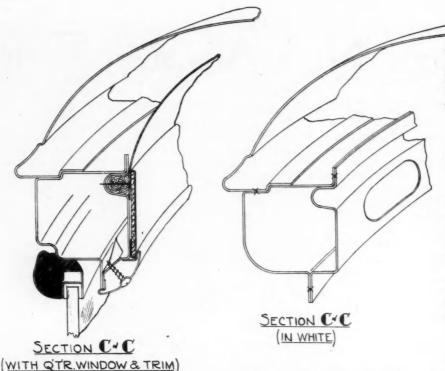
The roof is formed in a single stamp-

ing which includes the windshield and rear-window openings and the cowl top panel. It forms the keystone of the arch to which the other assemblies are welded. This formed arch is claimed not only to greatly increase the strength of the roof, but by stretching and permanently setting the metal, to prevent vibration and drumming. Furthermore, the graceful curve formed into the roof panel makes pos-



Automotive Industries

October 26, 1935



sible the blending of the lines of the car into a streamlined whole.

The side-panel stampings include quarter windows, door openings, door headers, sills, wheel housings and cowl sides, their construction being based on the forming of box sections which make use of the outside panel as part of the box. Since each door, window and windshield opening is complete in the die stamping, the closer fits assured tend to reduce air leakage and to assure permanent quietness. Door assemblies, consisting of inner and outer panels, are placed in the door openings of the side panels for shipment.

The remaining unit consists of the

lower back panel which includes the rear of the wheel housing and trunk lid opening.

These four major units, together with the dash pan and floor pan, are all designed so that the body can be completely assembled and conveniently spot-welded into a single unit of construction. This avoids all flashwelding and also soldering, with the exception of a joint of approximately 11 in. at the belt line just above the rear wheel housing. This is the only hand finished joint in the entire body.

A study of the accompanying illustrations will show how each stamping is designed to reinforce the adjacent units and how the joints between panels follow the natural lines of the car so that they are concealed by the mold-

Sectional views of the new Budd body supplementing those on the previous page

ings, as in Section AA, Fig. 1. The windshield post is designed to cover the front door post, which is included in the side panel. This results in a two-in-one construction or a post within a post between the front door opening and the windshield, and greatly increases the stiffness of the body, strengthening it at its most vulnerable point.

Section AA, through the roof over the doors, shows the application of the roof to the side panel, with X indicating the spotwelds. It also shows the box section which is part of the side panel unit. Section BB shows the center pillar box section. Section CC shows the construction at the top of the rear quarter window and the application of the roof at this point. It also shows the side-panel-unit box section.

Trim and upholstery are fastened to paper cord which is attached to grooves in the metal reinforcements. This cord is said to be silent under all conditions, lighter than wood, and does not splinter or burn.

An important advantage of the new design is that of economy in shipping. With the doors fitting temporarily into the openings in the side panels, and with the major unit assemblies nesting one into another, the units are easily handled in packing, shipping and assembly, and a maximum number of sets can be loaded into a freight

## Olds Adopts Aluminum Pistons

(Continued from page 553)

depressed while starting, the plunger contacts the starting motor, and when not in operation it is raised by a return spring and has no contact with the starting motor control arm. With this control, the opening in the dash is completely sealed.

To provide against vapor lock, the carburetor is fitted with an antipercolating device. This consists of a vertical by-pass which permits vapors to escape from the carburetor bowl. Ventilating openings are provided in the sides under the front fenders, fitted with shields to keep out water and dirt.

Five-passenger coupe models on both the six and eight have specially built sedan-type front seats which accommodate three persons comfortably. To give access to the rear compartment, one of the back rests of the front seats is swung forward around a hinge connecting the seat and back rest. Noteworthy among the interior fittings is an instrument panel finished in Brazillian rosewood.

On the rear panels of five-passenger models a wide chrome ornamental strip extends up through the center of the luggage compartment door panel and flares into a "T" at the top. The name "Oldsmobile" is carried across the top portion of the "T."

Propeller-shaft tunnels have been eliminated. The floor boards are flat and the passenger sitting in the center of the seat has as much leg room as those at his sides. The foot rest of the rear compartment is in a special recess under the rear of the front seat.

## Nine Months Car, Truck Output Tops Whole 1934 Production by 7 Per Cent.

Passenger car and truck production in the United States and Canada for the January-September period this year surpassed the total output for 12 months of 1934 by seven per cent. The increase for the first nine months of the current year compared with production during the comparative period of last year is 23 per cent. From Jan. 1 of this year to Sept. 30 car and truck output in this country and Canada totaled 3,066,456 comparing with 2,869,983 for the whole of last year and 2,492,695 for the January-September period, 1934.

Early shut-downs for model change-overs were reflected in production totals both in the truck and passenger car divisions in comparison with totals for August of this year and September of last year. Passenger

was 2,497,391 against 2,020,862 for the same period one year ago, an increase of 24 per

from the preceding month and the corresponding month last year were less than in the passenger car field. The September truck output of 34,024 was 43 per cent behind the August total of 59,830 and 26.5 per cent less than the 46,335 production in September, 1934. The nine months' output for the current year was 569,065 against 471,833 for the same period a year ago. This is a gain of 20 per cent.

The accompanying table shows comparative passenger car and truck production figures in this country and Canada in detail.

	•
car output	of 61,104 units dropped 67.5 per
cent from	the August total of 187,913 and
	from the September, 1934, total
	The nine months' total this year

Truck production decreases in September

With orders for new cars pouring in daily total production of 1936 Pontiacs has reached the 19,000 mark, the factories working two shifts daily, according to A. W. L. Gilpin, vice-president and general sales man-

000,000 in wages and salaries through nine

"Chevrolet is operating most of its plants

Other speakers included William S. Knud-

sen, General Motors executive vice-presi-

dent; Donaldson Brown, General Motors di-

rector; Arthur McPike, vice-president of the

Flint Chamber of Commerce, and A. B. C.

Hardy for General Motors executives, who

presented a scroll to Mr. Coyle. Mr. Knudsen said: "We have every rea-

son to believe we are on our way; we have left a big part of the depression behind.

Wherever I go I find the spirit of striving

to do things, to accomplish things, is taking

us out of the depression."

within a radius of 100 miles out of Detroit and two thirds of our employment is located

months this year.

within that area."

"Our total production during the last two weeks has been running at 800 cars per day which has given us over 4,000 cars each of those weeks," Mr. Gilpin said. "That makes a total of 18,907 of the 1936 models added to our total production of 1935 models. Since January 1 Pontiac has built 144,040 cars this year.

"Sales and deliveries are keeping pace with production. In the United States alone during the first nine months this year our retail deliveries amounted to 113,388 cars leaving the difference between that figure and 1935 model production a total of 125,-133 to be accounted for by deliveries in Canada and the rest of the world.

"Orders on hand for 1936 Pontiac cars to be delivered during the first 30 days are approximately 35,000, which represents a dollar value to the purchaser of some \$28,-

"Fulfillment of the prediction made by officials a month ago that Pontiac would build 48,000 of the 1936 cars by January 1 appears virtually assured."

Well sustained retail deliveries were reported by Chrysler dealers for week ended October 19, considering the approach of the show season, 1271 units being delivered, of which 305 were Chryslers and 966 Plymouths. In the 42 weeks of 1935 to October 19, Chrysler dealers delivered at retail 121, 449 Plymouths and 34,833 Chryslers a total of 156,282 units.

	September, 1935	August, 1935	September, 1934	Months, 1935	Months, 1934
Passenger Cars—U. S. and Cana Domestic Market—U. S. Foreign Market—U. S. Canada	49,905 7,380	168,269 14,120 5,524	4,211	2,210,703 177,486 109,202	87,027
Total	61,104	187,913	129,251	2,497,391	2,020,862
Trucks—U. S. and Canada; Domestic Market—U. S. Foreign Market—U. S. Canada	7,492	43,911 13,751 2,168	1,368	426,067 114,789 28,209	21,654
Total	34,024	59,830	46,335	569,065	471,833
Total—Domestic Market—U. S Total—Foreign Market—U. S Total—Canada	. 14,872	212,180 27,871 7,692	5,579	2,636,770 292,275 137,411	108,681
Total—Cars and Trucks—U. S and Canada		247,743	175,586	3,066,456	2,492,695

#### Confidence Rises As Shows Approach

(Continued from Page 535)

tion as to whether or not the public's interest in motor vehicles can be aroused as well at this time as when announcements are made in January.

Whether buying habits will be materially changed is still a question. Attendance at dealers' showings of new models this year has not been as great as when the 1935 cars were presented, although buying is reported to be better.

Good progress is being made in steppingup production on the new models. It appears now that the industry will turn out more than 200,000 vehicles this month. The three volume producers alone will account for approximately 160,000 units.

With the industry facing a substantial increase in production next year, a shortage of skilled mechanics in certain trades promises to become acute in the near future unless manufacturers interest themselves in the subject of apprenticeship. A conference of employers is to be held on this problem in Detroit next Tuesday and will be attended by manufacturers and educational leaders. The conference is sponsored by the Michigan Manufacturers Association, the,

National Metal Trades Association and the Employers Association of Detroit.

More than 1,000,000 cars and trucks will be produced by Chevrolet Motor Co. this year, M. E. Coyle, president, told a gathering of 2500 persons at the dinner given the company Wednesday evening by the Flint Chamber of Commerce. Mr. Coyle, principal speaker at the banquet, said to be the largest ever held in Michigan and which was attended by nearly 100 Chevrolet and General Motors officials, said:

"We have in the past two years increased our output by 200,000 units each year. We produced 600,000 vehicles in 1933 and 800,-000 in 1934." He called attention to the company's \$25,000,000 expansion program which he said "should give us adequate facilities so that we will not again in 1935 fail to take a strong position in the market due to lack of product.

"We employed in Flint during the first nine months in 1935 15,000 people to whom we paid \$18,000,000, an average per man of \$1200," Mr. Coyle said. "In the nine months period we employed in Michigan 38,000 people to whom in that same period we paid \$44,000,000, an average \$1150 per person employed. Nationally Chevrolet employs 60,000 people and has paid out \$63,-

#### Motor Shares Advance

(Continued from Page 535)

The market generally was strong at Thursday noon but not so active as it had been in previous days. The strain of the New Haven Railroad announcement that it would seek reorganization through Section 77 of the Bankruptcy Act, had some influence on trading, but not sufficient to change the generally bullish nature of the market. Rails as a group withstood the announcement well. While none made new high ground, no appreciable loss was recorded.

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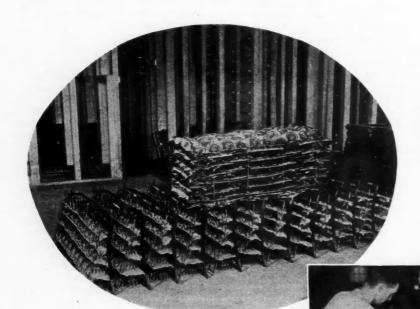
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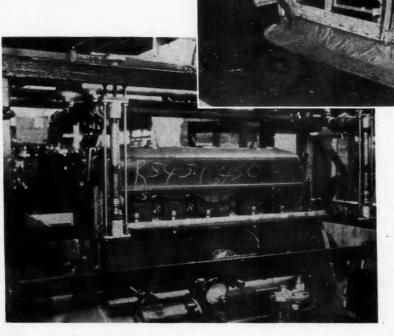
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# Chevrolet Eliminates Errors Use of Jigs and Fixtures at



Twelve seat-cushion springs are compressed into the space normally occupied by two springs to save bulk in shipping. A power press is used to squeeze them together, then they are securely wired. When unpacked overseas, they are placed in a device that holds the springs when the wires are cut, then controls their expansion.

Every inch of cubic space is utilized for packing. Here the tunnel formed by the window openings through two lines of doors are loaded with floor mats, rubber channels, upholstery material and other body parts. Window garnish mouldings are placed in the space below the window openings.



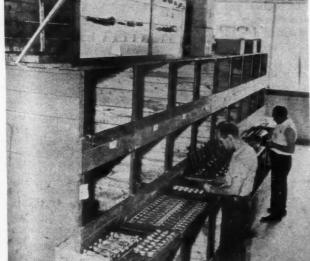
As the stripped engine rolls along on a mechanical conveyor, its cylinders receive a measured quantity of oil from this automatic device, which travels for a short distance with the engine. Six jets of oil are forced from the nozzles seen on the horizontal pipe, entering through the spark plug openings.

# in Packing for Export by the Their Bloomfield, N. J., Plant

A crane-way 500 feet long parallels the double track railroad spur alongside the plant. Boxes are loaded into gondola cars, to be transferred to lighters that carry them to steamships.



Accurate count of parts required for a shipment of 12 sedans, 12 ton-and-e-half trucks, or any other 12 similar models, is gained by eliminating the need of counting. For each box passing down the conveyor line, these workers must first fill up the jigs or fixtures, which hold the exact number of parts needed. A glance of the inspector shows whether the count is correct. Furthermore, the jigs are so devised that a right-side part—such as a headlamp support—cannot be placed in the space that should receive a left-side part.



Here is a jig to hold twelve each of parts for right-hand drive Master chassis. By turning over the jig on its trunnions, it is made to serve for left-hand drive models. Among the parts shown are brake and clutch pedals, tail lamp supports, brake cross shafts, accelerator cross shafts, steering connecting rods, and pedal shaft assemblies.

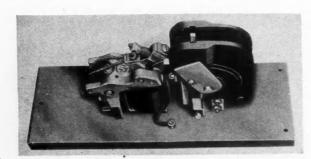
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# NEW DEVELOPMENTS

# Automotive Parts, Accessories Taylor Water Dynamometer and Production Tools



Line-Arc Contactor

#### New "Line-Arc" Magnetic Contactors

For use on crane machinery controllers and other direct current applications, The Electric Controller & Mfg. Co., Cleveland, Ohio, announces a complete line of new magnetic contactors, in which the arc, formed as the circuit is opened, is ruptured in a narrow path or line centered between, but not touching the arc shields.

As the contacts of these Line-Arc contactors start to separate, the arc is immediately removed from the contact tips, one end travelling rapidly up the circular copper guard over the blowout coil, and the other end moving in the opposite direction along a horizontal arcing plate located between the front of the arc shields. Because of the reduced operating temperatures, it is claimed that this design results in greatly increased contact life.

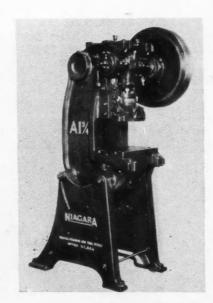
The Line-Arc contactors are built in sizes up to and including 800 ampere capacity.

#### Niagara Adds Inclinable Press

The Niagara Machine & Tool Works, Buffalo, N. Y., announces a new press with an easily adjusted inclining device provided to tilt the press in any desired working position. The 1% inch shaft runs in bearings which are split at an angle of 45 degrees from the vertical, the construction being such that the thrust is transmitted direct to the frame.

This machine employs the Niagara sleeve clutch recently described in AUTOMOTIVE INDUSTRIES. It is claimed that the 14 engaging jaws eliminate the time lag between the instant of depressing the treadle and actual clutch engagement, resulting in higher productive output. A positive locking device is built in the throwout to prevent accidental engagement of the clutch when setting dies.

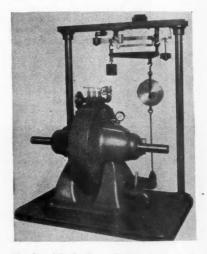
Double "V" gibs on each side of the slide are designed for rigidity, as well as to provide adequate bearing surface and to maintain a true bearing under heavy loads. The gibs are adjustable and if necessary can be replaced in case of damage.



Niagara Inclinable Press

The Taylor Manufacturing Corporation, Milwaukee, Wis., has added a new high-speed type dynamometer to its line, which now includes capacities from 1/10 to 10,000 hp. The intake valves on this "Hi-Eff" testing machine are of such design that they give close calibration with minimum water consumption. It is claimed that the combination of correctly proportioned peripheral and side-wall teeth on both the stator and rotor results in high capacity in relation to the size of the ma-

In order to insure continuous operation, provision has been made for com-



Taylor High Speed Dynamometer

plete lubrication and for adjustment of the packing glands while the dynamometer is running.

The manufacturer states that due to the torque characteristics of the machine the indicating dial pointer does not vibrate or flicker, but moves steadily with each load change.

#### Finishing Machine for Internal Gears

A finishing machine for internal gears operating on the same principle as its crossed axes machines used for finishing helical and spur gears, has been developed by the Michigan Tool Co., Detroit, Mich. While special purpose in character, the new machine is quite flexible, in that the pot-chuck in which the internal gear is mounted, is fitted with adapters which can be varied to take virtually any normal size of internal gear.

As shown in the illustration, the

# NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

laminated or serrated cutter is mounted on a vertical arbor, which in turn is mounted in an eccentrically driven holder. The internal gear being cut, is free to turn with its adapter on roller bearings. The axes for the arbor and for the internal gear are at an angle to each other, which results in a relative sliding motion of the cutter and gear, lengthwise of the tooth, thus producing a "shaving" action diagonally across the flank.

A novel feature of this machine is the feed. As the cutter carrying arbor rotates, driving the internal gear, the arbor holder slowly rotates eccentrically so that the arbor itself moves gradually on an arc, approaching the gear. As it moves on this arc, the cutting teeth are thus fed outward, and into the internal gear teeth. At the center point of this arc, representing the closest approach of the arbor to the internal gear, the pitch circles of the cutter teeth and the internal gear teeth coincide, and the maximum depth of cut has been reached.

This machine is said to be particularly adapted to the finishing of internal, overdrive transmission gears.

#### Automatic Control for Gas Furnace

An automatic firing device for use in connection with gas furnaces is being produced by The Bristol Company at Waterbury, Conn. To prevent filling the furnace with raw gas with the attendant danger of explosion, a 45-second delay on the pilot flame, with a thermo-couple control to show whether or not it is lit before the main line opens, is provided. The main line remains open only 10 seconds unless the flame is ignited, otherwise it shuts off and the cycle is repeated. A feature of this device which makes it particularly adapted for use with core ovens, etc., is the pre-heating of the air before it enters the furnace.

#### Allis-Chalmers Extends Line

Its line of vari-pitch sheaves used with Texrope drive, recently described in Automotive Industries, has been increased by the Allis-Chalmers Manufacturing Company of Milwaukee, Wis. The standard line now includes 25 different diameters of sheaves from 3 in. up to 18 in. inclusive, with any number of grooves from 2 to 6. All of these sheaves are now available with interchangeable type hubs.



Michigan Tool Gear Machine

that they can be used with "A" section belts, ½ x 11/32 in. or "B" section belts, 21/32 x 7/16 in., depending on the application. Up to 15 hp. can be transmitted with this type of V-belt drive.

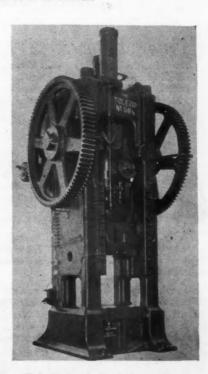
#### Improved Toledo Press

The Toledo Machine and Tool Co., Toledo, Ohio, has made several important changes in its new series of straight column presses recently placed on the market. The crown has been heavily reinforced and the tie rods which are of increased diameter, now extend through the top of the arch. The frame castings are of a special high alloy mixture said to possess great strength and surface hardness. The crankshaft which is of the semieccentric type with an extra large crankpin and heavy cheeks, is supported close to the frame of the press.

The clutch is of a new air type mounted in the flywheel with electric push button control, enabling the operator to stop or start the press at any point of the stroke, or to inch the slide when setting or testing dies.

The press illustrated has a 16-inch

The texsteel sheaves are so designed stroke, and the slide is counterbalanced by two air cylinders shown at the top of the crown. The bed area is 50 x 43 inches.



Toledo Straight Column Press

#### Dissociation of Gases of Combustion

Dissoziation von Verbrennungsgasen und ihr Einfluss auf den Wirkungsgrad von Vergasermaschninen (Dissociation of Gases of Combustion and its Influence on the Efficiency of Carburetor Engines) by H. Kühl. V.D.I. Research paper No. 373. Published by V.D.I. Verlag, Berlin NW 7, Ger-

PHYSICO-CHEMICAL research has led to the recognition that the specific heats of gases and vapors do not increase indefinitely at higher temperatures but approach certain limiting values. Values of the specific heats of gases determined from spectroscopic data have been found more reliable than those determined by direct experiment. H. Kühl therefore has newly computed tables of these values.

From the composition of the dissociated gases the corresponding values are determined, and clear diagrams are given for the gases of combustion of an average gasoline for air excess values of 0.6, 0.8, 1.0, 1.2, 1.4 and 1.6—that is for combustible mixtures in which the amount of air is equal to that theoretically required for complete combustion of the fuel content, multiplied by these coefficients.

With the aid of these diagrams the thermal efficiency of the ideal cycle of carburetor engines is calculated for different air-excess values, compression ratios, initial temperatures and initial pressures. In the case of a theoretically correct mixture (air-excess coefficient =1) the dissociation results in a drop in efficiency of 4-5 per cent. The influence of dissociation drops rapidly with increase in the air excess and even more rapidly with deficiency in the amount of air.

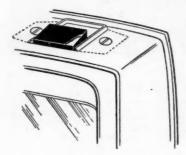
In the ideal Diesel cycle dissociation can generally be neglected.

INTERNATIONAL TIN RESEARCH AND DEVELOPMENT COUNCIL, 149 Broadway, New York, N. Y .- The Properties of Some Special Bronzes, by Professor D. Hanson, D.Sc. and M. A. Wheeler.

REPUBLIC STEEL CORPORATION, Massillon, Ohio.-Reprint of article on Alloy Sheet Steel (Copper-Nickel-Molybdenum) by Howard L. Miller, metallurgist of the Republic Steel Company. The article deals with what are known as Republic Double Strength steels.

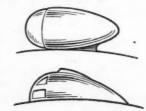
# WHAT'S NEW IN Plastics!

THIS MONTH **Bumper Blocks, Light Bodies** Gaskets, etc.



Bumper Blocks: Friction-resistant Durez 1564 is still No. 1 material for door bumper blocks, because it's squeak-proof, rust-proof, non-resonant, wear-resistant and never needs grease. Reid Products make an assembly (see cut) for a well-known line, involving Durez blocks sliding against springs for tension. Other variations include tapered Durez blocks which slam against metal plates, and some Durez-to-Durez tension assemblies are coming.

Fender Lights: The possibility of molding fender-light bodies from Durez bears investigating. Difficult stamping operations would become simple moldings, with cut-outs, threaded inserts, terminal-posts, lamp-sockets and insulation molded in during the single operation. They'd be rustproof, dent-proof, rattle-proof.





Gaskets: There are places, it seems, where molded Durez gaskets work better than stamped sheet materials. Carburetor gaskets, for one. As you know, Durez resists action of oil, water, gasoline, grease, etc., and can be molded in thick or thin sections. Small gaskets with a structural function are probably most logical.

New Materials: Durez 37 for arc-resisting parts such as distributors is one of the newer special-quality Durez compounds. Besides its arc-resistance, it has a heat-resistance greater than most special heat-resisting materials.

If you're not familiar with Durez, we add that it's a hot-molded plastic, supplied either in molding compound form or as resins for impregnating, coating, etc., or in sheet form. New materials are being constantly developed, and we're always anxious to work with you in adapting this versatile material to your needs. Address: General Plastics, Inc., 452 Walck Road, North Tonawanda, N. Y.

Choice of the Motor Industry DUREZ · Plastic Materials

#### The Cracking Art

The Cracking Art in 1934, by Gustave Egloff and Emma E. Crandal, published by Universal Oil Products Co., 310 So. Michigan Ave., Chicago.

HIS book reviews the progress of cracking processes in the oil industry during the year 1934. A large number of American and foreign patents on cracking processes and equipment are briefly reviewed. It is pointed out that cracking is becoming constantly more important in the petroleum industry, one of the reasons being that it yields a product which ranks high from the standpoint of anti-detonating quality. Fuels of high anti-knock value are greatly in demand, because the compression ratios of engines are constantly being increased and fuels of high anti-detonating value are needed for these engines. It is estimated that the average octane value of the regular gasolines sold in the eastern section of the United States during 1934 was 69-70, while for 1935 it is expected to be 70-71. The average of the premium fuels is about 76, while that of straightrun gasolines, which are sold as thirdgrade fuels, averages 55.

The octane number of gasolines is increased by cracking. Other advantages that have been claimed for cracked gasolines are that they enable an engine to develop power after it has started knocking and that more horsepower-hours per gallon are developed than by leaded fuels of the same octane